

# REVISION RECORD FOR THE STATE OF CALIFORNIA

## SUPPLEMENT

July 1, 2018

### 2016 Title 24, Part 2.5, California Residential Code

#### General Information:

1. The date of this supplement is for identification purposes only. See the History Note Appendix at the end of the code.
2. This supplement is issued by the California Building Standards Commission in order to provide new and/or replacement pages containing recently adopted provisions for California Code of Regulations, Title 24, Part 2.5, of the 2016 *California Residential Code*. Instructions are provided below.
3. Health and Safety Code Section 18938.5 establishes that only building standards in effect at the time of the application for a building permit may be applied to the project plans and construction. This rule applies to both adoptions of building standards for Title 24 by the California Building Standards Commission and local adoptions and ordinances imposing building standards. The new building standards provided with the enclosed blue supplement pages must not be enforced before the effective date.
4. Not all code text on the enclosed blue supplement pages is a new building standard. New, amended, or repealed building standards are identified by margin symbols. An explanation of margin symbols is provided in the code before the table of contents.
5. You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.

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# Part I—Administrative

## CHAPTER 1 SCOPE AND APPLICATION DIVISION I CALIFORNIA ADMINISTRATION

### SECTION 1.1 GENERAL

**1.1.1 Title.** These regulations shall be known as the California Residential Code, may be cited as such and will be referred to herein as “this code.” The California Residential Code is Part 2.5 of thirteen parts of the official compilation and publication of the adoption, amendment and repeal of building regulations to the California Code of Regulations, Title 24, also referred to as the California Building Standards Code. This part incorporates by adoption the 2015 International Residential Code of the International Code Council with necessary California amendments.

**1.1.2 Purpose.** The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, access to persons with disabilities, sanitation, adequate lighting and ventilation, and energy conservation; safety to life and property from fire and other hazards attributed to the built environment; and to provide safety to fire fighters and emergency responders during emergency operations.

**1.1.3 Scope.** The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every detached one- and two-family dwelling and townhouse not more than three stories above grade plane in height with a separate means of egress and structures accessory thereto throughout the State of California.

#### Exceptions:

1. Live/work units complying with the requirements of Section 419 of the California Building Code shall be permitted to be built as one- and two-family dwellings or townhouses. Fire suppression required by Section 419.5 of the California Building Code when constructed under the California Residential Code for one- and two-family dwellings shall conform to Section 903.3.1.3 of the California Building Code.
2. Owner-occupied lodging houses with five or fewer guestrooms shall be permitted to be constructed in accordance with the California Residential Code for one- and two-family dwellings when equipped with a fire sprinkler system in accordance with Section R313.

**1.1.3.1 Classification.** Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups listed below. A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied. Structures with multiple occupancies or uses shall comply with Section 508 of the California Building Code. Where a structure is proposed for a purpose that is not specifically provided for in this code, such structure shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved in accordance with this code or the California Building Code.

**1.1.3.1.1 Residential Group R.** Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I. Residential occupancies shall include the following:

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-2.1, R-3.1, R-4 or I, including: Buildings that do not contain more than two dwelling units.

Townhouses not more than three stories above grade in height with a separate means of egress.

Adult facilities that provide accommodations for six or fewer persons of any age for less than 24-hours. Licensing categories that may use this classification include, but are not limited to:

Adult Day Programs.

Child care facilities that provide accommodations for six or fewer persons of any age for less than 24-hours. Licensing categories that may use this classification include, but are not limited to:

Day-care Center for Mildly Ill Children, Infant Care Center and School Age Child Day-care Center.

Family Day-care Homes that provide accommodations for 14 or fewer children, in the provider's own home for less than 24-hours.

*Congregate living facilities or congregate residences with 16 or fewer persons.*

*R-3.1 This occupancy group may include facilities licensed by a governmental agency for a residentially based 24-hour care facility providing accommodations for six or fewer clients of any age. Clients may be classified as ambulatory, nonambulatory or bedridden. A Group R-3.1 occupancy shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in Section R335 Special Provisions For Licensed 24-Hour Care Facilities in a Group R-3.1 Occupancy. This group may include:*

- Adult Residential Facilities Congregate Living Health Facilities*
- Foster Family Homes*
- Group Homes*
- Intermediate Care Facilities for the developmentally disabled habilitative*
- Intermediate Care Facilities for the developmentally disabled nursing*
- Nurseries for the full-time care of children under the age of six, but not including "infants" as defined in Section 202*
- Residential Care Facilities for the Elderly*
- Small Family Homes and Residential Care Facilities for the chronically ill*

**Exception:** *Foster Family Homes or Group Homes licensed by the Department of Social Services which provide nonmedical board, room and care for six or fewer ambulatory children or children two years of age or younger, and which do not have any nonambulatory clients shall not be subject to regulations found in Section R335.*

*Pursuant to Health and Safety Code Section 13143 with respect to these exempted facilities, no city, county or public district shall adopt or enforce any requirement for the prevention of fire or for the protection of life and property against fire and panic unless the requirement would be applicable to a structure regardless of the special occupancy. Nothing shall restrict the application of state or local housing standards to such facilities if the standards are applicable to residential occupancies and are not based on the use of the structure as a facility for ambulatory children. For the purpose of this exception, ambulatory children does not include relatives of the licensee or the licensee's spouse.*

*Large Family Day-Care Homes. See Section R336.*

**1.1.3.1.2 Utility and Miscellaneous Group U.** *Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:*

*Agricultural buildings*

*Aircraft hangars, accessory to a one- or two-family residence (see Section 412.5 of the California Building Code)*

*Barns*

*Carports*

*Fences more than 7 feet (2134 mm) high*

*Grain silos, accessory to a residential occupancy*

*Greenhouses*

*Livestock shelters*

*Private garages*

*Retaining walls*

*Sheds*

*Stables*

*Tanks*

*Towers*

**1.1.3.2 Regulated buildings, structures and applications.**

*The model code, state amendments to the model code, and/or state amendments where there are no relevant model code provisions shall apply to detached one- and two-family dwellings, townhouses, and structures accessory thereto. State agencies with regulatory authority as specified in Sections 1.2 through 1.14, except where modified by local ordinance pursuant to Section 1.1.8. When adopted by a state agency, the provisions of this code shall be enforced by the appropriate enforcing agency, but only to the extent of authority granted to such agency by the state legislature.*

**Note:** *See Preface to distinguish the model code provisions from the California provisions.*

- 1. One- and two-family dwellings, townhouses, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with common toilets or cooking facilities. See Section 1.8.2.1.1.*
- 2. Permanent buildings and permanent accessory buildings or structures constructed within mobile-home parks and special occupancy parks regulated by the Department of Housing and Community Development. See Section 1.8.2.1.3.*
- 3. Applications regulated by the Office of the State Fire Marshal include, but are not limited to, the following in accordance with Section 1.11:*
  - 3.1. Buildings or structures used or intended for use as a/an:*
    - 1. Home for the elderly, children's nursery, children's home or institution, school or any similar occupancy of any capacity*
    - 2. Small family day-care homes, large family day-care homes, residential facilities and residential facilities for the elderly, residential care facilities*
    - 3. State institutions or other state-owned or state-occupied buildings*
    - 4. Residential structures*
    - 5. Tents, awnings or other fabric enclosures used in connection with any occupancy*

6. Fire alarm devices, equipment and systems in connection with any occupancy
7. Wildland-urban interface fire areas

**1.1.4 Appendices.** Provisions contained in the appendices of this code shall not apply unless specifically adopted by a state agency or adopted by a local enforcing agency in compliance with Health and Safety Code Section 18901 et seq. for Building Standards Law, Health and Safety Code Section 17950 for State Housing Law and Health and Safety Code Section 13869.7 for Fire Protection Districts. See Section 1.1.8 of this code.

**1.1.5 Referenced codes.** The codes, standards and publications adopted and set forth in this code, including other codes, standards and publications referred to therein are, by title and date of publication, hereby adopted as standard reference documents of this code. When this code does not specifically cover any subject related to building design and construction, recognized architectural or engineering practices shall be employed. The National Fire Codes, standards and the Fire Protection Handbook of the National Fire Protection Association are permitted to be used as authoritative guides in determining recognized fire prevention engineering practices.

**1.1.6 Nonbuilding standards, orders and regulations.** Requirements contained in the International Residential Code, or in any other referenced standard, code or document, which are not building standards as defined in Health and Safety Code Section 18909, shall not be construed as part of the provisions of this code. For nonbuilding standards, orders and regulations, see other titles of the California Code of Regulations.

**1.1.7 Order of precedence and use.**

**1.1.7.1 Differences.** In the event of any differences between these building standards and the standard reference documents, the text of these building standards shall govern.

**1.1.7.2 Specific provisions.** Where a specific provision varies from a general provision, the specific provision shall apply.

**1.1.7.3 Conflicts.** When the requirements of this code conflict with the requirements of any other part of the California Building Standards Code, Title 24, the most restrictive requirements shall prevail.

**1.1.7.3.1 Detached one- and two-family dwellings.** Detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures may be designed and constructed in accordance with this code or the California Building Code, but not both, unless the proposed structure(s) or element(s) exceed the design limitations established in this code and the code user is specifically directed by this code to use the California Building Code.

**1.1.8 City, county, or city and county amendments, additions or deletions.** The provisions of this code do not limit the authority of a city, county, or city and county governments to establish more restrictive and reasonably necessary differences to the provisions contained in this code pursuant to complying with Section 1.1.8.1. The effective date of amendments, additions or deletions to this code by a city, county, or city and county filed pursuant to Section 1.1.8.1 shall be the date filed. However, in no case shall the amendments, additions or deletions to this code be effective any sooner than the effective date of this code.

Local modifications shall comply with Health and Safety Code Section 18941.5 for Building Standards Law, Health and Safety Code Section 17958 for State Housing Law or Health and Safety Code Section 13869.7 for Fire Protection Districts.

**1.1.8.1 Findings and filings.**

1. The city, county, or city and county shall make express findings for each amendment, addition or deletion based upon climatic, topographical or geological conditions.

**Exception:** Hazardous building ordinances and programs mitigating unreinforced masonry buildings.

2. The city, county, or city and county shall file the amendments, additions or deletions expressly marked and identified as to the applicable findings. Cities, counties, cities and counties, and fire departments shall file the amendments, additions or deletions, and the findings with the California Building Standards Commission at 2525 Natomas Park Drive, Suite 130, Sacramento, CA 95833.
3. Findings prepared by fire protection districts shall be ratified by the local city, county, or city and county and filed with the California Department of Housing and Community Development, Division of Codes and Standards, P.O. Box 1407, Sacramento, CA 95812-1407 or 2020 W. El Camino Avenue, Suite 250, Sacramento, CA 95833-1829.

**1.1.9 Effective date of this code.** Only those standards approved by the California Building Standards Commission that are effective at the time an application for building permit is submitted shall apply to the plans and specifications for, and to the construction performed under, that permit. For the effective dates of the provisions contained in this code, see the History Note page of this code.

**1.1.10 Availability of codes.** At least one complete copy each of Titles 8, 19, 20, 24 and 25 with all revisions shall be maintained in the office of the building official responsible for the administration and enforcement of this code. Each state department concerned and each city, county, or city and county shall have an up-to-date copy of the code available for public inspection. See Health and Safety Code Section 18942(e) (1) and (2).

**1.1.11 Format.** This part fundamentally adopts the International Residential Code by reference on a chapter-by-chapter basis. When a specific chapter of the International Residential Code is not printed in the code and is marked “Reserved” such chapter of the International Residential Code is not adopted as a portion of this code. When a specific chapter of the International Residential Code is marked “Not adopted by the State of California” but appears in the code, it may be available for adoption by local ordinance.

**Note:** Matrix Adoption Tables at the front of each chapter may aid the code user in determining which chapter or sections within a chapter are applicable to buildings under the authority of a specific state agency, but they are not to be considered regulatory.

**1.1.12 Validity.** If any chapter, section, subsection, sentence, clause or phrase of this code is for any reason held to be unconstitutional, contrary to statute, exceeding the authority of the state as stipulated by statutes or otherwise inoperative, such decision shall not affect the validity of the remaining portion of this code.

**SECTION 1.2  
Reserved**

**SECTION 1.3  
Reserved**

**SECTION 1.4  
Reserved**

**SECTION 1.5  
Reserved**

**SECTION 1.6  
Reserved**

**SECTION 1.7  
Reserved**

**SECTION 1.8  
DEPARTMENT OF HOUSING  
AND COMMUNITY DEVELOPMENT (HCD)**

**1.8.1 Purpose.** The purpose of this code is to establish the minimum requirements necessary to protect the health, safety and general welfare of the occupants and the public by governing accessibility, erection, construction, reconstruction, enlargement, conversion, alteration, repair, moving, removal, demolition, occupancy, use, height, court, area, sanitation, ventilation, maintenance and safety to life and property from fire and other hazards attributed to the built environment.

**SECTION 1.8.2  
AUTHORITY AND ABBREVIATIONS**

**1.8.2.1 General.** The Department of Housing and Community Development is authorized by law to promulgate and adopt building standards and regulations for several types of building applications. The applications under the authority of the Department of Housing and Community Development are listed in Sections 1.8.2.1.1 through 1.8.2.1.3.

**1.8.2.1.1 Housing construction.**

**Application**—Hotels, motels, lodging houses, apartments, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities including accessory buildings, facilities and uses thereto. Sections of this code which pertain to applications listed in this section are identified using the abbreviation “HCD 1.”

**Enforcing agency**—Local building department or the Department of Housing and Community Development.

**Authority cited**—Health and Safety Code Sections 17040, 17050, 17920.9, 17921, 17921.3, 17921.6, 17921.10, 17922, 17922.6, 17922.12, 17927, 17928, 17959.6, 18300, 18552, 18554, 18620, 18630, 18640, 18670, 18690, 18691, 18865, 18871.3, 18871.4, 18873, 18873.1, 18873.2, 18873.3, 18873.4, 18873.5, 18938.3, 18944.11 and 19990; and Government Code Section 12955.1.

**Reference**—Health and Safety Code Sections 17000 through 17062.5, 17910 through 17995.5, 18200 through 18700, 18860 through 18874, 19960 through 19997; and Government Code Sections 12955.1 and 12955.1.1.

**1.8.2.1.2 Housing accessibility.**

**Application**—Covered multifamily dwellings as defined in Chapter 2 of the California Building Code including, but not limited to, lodging houses, dormitories, timeshares, condominiums, shelters for homeless persons, congregate residences, apartments, dwellings, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities.

Disabled access regulations promulgated under HCD authority are located in Chapter 11A of the California Building Code and are identified by the abbreviation “HCD 1-AC.” The application of such provisions shall be in conjunction with other requirements of the Building Standards Code and apply only to newly constructed covered multifamily dwellings as defined in Chapter 2 of the California Building Code. “HCD 1-AC” applications include, but are not limited to, the following:

1. All newly constructed covered multifamily dwellings as defined in Chapter 2 of the California Building Code.
2. New common use areas as defined in Chapter 2 of the California Building Code serving existing covered multifamily dwellings.

## CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE CHAPTER 2 – DEFINITIONS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R201.1			X																		
R201.2			X																		
R201.3			X	X																	
R201.4			X																		
ACCESSORY STRUCTURE			X																		
ADDITION			X																		
AGED HOME OR INSTITUTION			X																		
ALTERATION			X	X																	
APPROVED			X	X																	
APPROVED AGENCY			X	X																	
APPROVED LISTING AGENCY			X	X																	
APPROVED TESTING AGENCY			X	X																	
ATTIC			X																		
ATTIC, HABITABLE			X																		
BASEMENT			X																		
BEDRIDDEN PERSON			X																		
BUILDING			X	X																	
BUILDING OFFICIAL			X																		
BUILT-UP ROOF COVERING			X																		
CARE AND SUPERVISION			X																		
CATASTROPHICALLY INJURED			X																		
CEILING HEIGHT			X																		
CHILD-CARE CENTER			X																		
CHILD OR CHILDREN			X																		
CHRONICALLY ILL			X																		
CLIMATE ZONES				X																	
CLOSET			X																		
COMBUSTIBLE MATERIAL			X																		
CONGREGATE LIVING HEALTH-FACILITY (CLHF)			X																		
CONGREGATE RESIDENCE			X																		
CONSTRUCTION DOCUMENTS			X																		
DAYCARE			X																		
DAY-CARE HOME, FAMILY			X																		
DAY-CARE HOME, LARGE FAMILY			X																		
DAY-CARE HOME, SMALL FAMILY			X																		
DEPARTMENT				X																	
DESIGN PROFESSIONAL			X																		

(continued)



**CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE  
CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below			X																		
Chapter / Section																					
DRAFT STOP			X																		
DUCT SYSTEM				X																	
DWELLING			X																		
DWELLING UNIT			X																		
EMERGENCY ESCAPE AND RESCUE OPENING			X																		
ENFORCEMENT				X																	
ENFORCEMENT AGENCY				X																	
ENFORCING AGENCY			X	X																	
EXTERIOR WALL			X																		
FAMILY				X																	
FENESTRATION				X																	
FIREBLOCKING			X																		
FIRE-RETARDANT-TREATED WOOD			X																		
FIRE SEPARATION DISTANCE			X																		
FLAME SPREAD			X																		
FLAME SPREAD INDEX			X																		
FULL-TIME CARE			X																		
GRADE			X																		
GRADE FLOOR OPENING			X																		
GRADE PLANE			X																		
GUARD OR GUARDRAIL				X																	
HABITABLE SPACE			X																		
HANDRAIL			X																		
HAZARDOUS LOCATION			X																		
HEIGHT, BUILDING			X																		
HEIGHT, STORY			X																		
IGNITION SOURCE			X																		
INFANT			X																		
INSULATING SHEATHING				X																	
LABEL			X																		
LABELED			X	X																	
LIMITED-DENSITY OWNER- BUILT RURAL DWELLINGS				X																	
LISTED			X	X																	
LISTING AGENCY				X	X																
LIVING SPACE			X																		
LODGING HOUSE				X																	
LOT			X																		
LOT LINE			X																		
MARK			X																		

(continued)

## Part II—Definitions

### CHAPTER 2 DEFINITIONS

*Code change proposals to definitions in this chapter preceded by a bracketed letter are considered by the IRC-Building Code Development Committee [RB] or the IECC-Residential Code Development Committee [RE] during the Group B (2016) Code Development cycle. See page x for explanation.*

#### SECTION R201 GENERAL

**R201.1 Scope.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings indicated in this chapter.

**R201.2 Interchangeability.** Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

**R201.3 Terms defined in other codes.** Where terms are not defined in this code such terms shall have meanings ascribed to them as in *the California Building Standards Code, Title 24, California Code of Regulations*.

**R201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

*For applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies. Webster's Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinarily accepted meanings.*

#### SECTION R202 DEFINITIONS

**[RB] ACCESSORY STRUCTURE.** A structure that is accessory to and incidental to that of the dwelling(s) and that is located on the same lot.

**[RB] ADDITION.** An extension or increase in floor area or height of a building or structure.

**[RB] ADHERED STONE OR MASONRY VENEER.** Stone or masonry veneer secured and supported through the adhesion of an approved bonding material applied to an approved backing.

**AGED HOME OR INSTITUTION.** A facility used for the housing of persons 65 years of age or older in need of care and supervision. (See definition of "care and supervision.")

**[RB] AIR-IMPERMEABLE INSULATION.** An insulation having an air permeance equal to or less than 0.02 L/s-m<sup>2</sup> at

75 Pa pressure differential as tested in accordance with ASTM E2178 or E283.

**[RB] ALTERATION.** Any construction or renovation to an existing structure other than repair or addition.

**[RB] ALTERNATING TREAD DEVICE.** A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

**[RB] ANCHORED STONE OR MASONRY VENEER.** Stone or masonry veneer secured with approved mechanical fasteners to an approved backing.

**ANCHORS.** See "Supports."

**[RB] APPROVED.** Acceptable to the building official.

**APPROVED. (HCD 1)** Meeting the approval of the enforcing agency, except as otherwise provided by law, when used in connection with any system, material, type of construction, fixture or appliance as the result of investigations and tests conducted by the agency, or by reason of accepted principles or tests by national authorities or technical, health, or scientific organizations or agencies.

#### Notes:

1. See Health and Safety Code Section 17920 for "Approved" as applied to residential construction and buildings or structures accessory thereto, as referenced in Section 1.8.2.1.1.
2. See Health and Safety Code Section 17921.1 for "Approved" as applied to the use of hotplates in residential construction referenced in Section 1.8.2.1.1.
3. See Health and Safety Code Section 19966 for "Approved" as applied to factory-built housing as referenced in Section 1.8.3.2.5.
4. See Health and Safety Code Section 18201 for "Approved" as applied to mobilehome parks as referenced in Section 1.8.3.2.2.
5. See Health and Safety Code Section 18862.1 for "Approved" as applied to special occupancy parks as referenced in Section 1.8.3.2.3.

**[RB] APPROVED AGENCY.** An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, where such agency has been



## DEFINITIONS

approved by the building official. (HCD 1) "Approved agency" shall mean "Listing agency" and "Testing agency."

**APPROVED LISTING AGENCY.** Any agency approved by the enforcing agency, unless otherwise provided by statute, which is in the business of listing and labeling and which makes available at least an annual published report of such listings in which specific information is included that the product has been tested to recognized standards and found to comply.

**APPROVED TESTING AGENCY.** Any agency which is determined by the enforcing agency, except as otherwise provided by statute, to have adequate personnel and expertise to carry out the testing of systems, materials, and construction fixtures or appliances.

**[RB] ASPECT RATIO.** The ratio of longest to shortest perpendicular dimensions, or for wall sections, the ratio of height to length.

**[RB] ATTIC.** The unfinished space between the ceiling assembly and the roof assembly.

**[RB] ATTIC, HABITABLE.** A finished or unfinished area, not considered a story, complying with all of the following requirements:

1. The occupiable floor area is not less than 70 square feet (6.5 m<sup>2</sup>), in accordance with Section R304.
2. The occupiable floor area has a ceiling height in accordance with Section R305.
3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.

**[RB] BASEMENT.** A story that is not a story above grade plane. (see "Story above grade plane").

**[RB] BASEMENT WALL.** The opaque portion of a wall that encloses one side of a basement and has an average below grade wall area that is 50 percent or more of the total opaque and nonopaque area of that enclosing side.

**[RB] BASIC WIND SPEED.** Three-second gust speed at 33 feet (10 058 mm) above the ground in Exposure C (see Section R301.2.1) as given in Figure R301.2(4)A.

**BATTERY SYSTEM, STATIONARY STORAGE.** A rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls, and associated electrical equipment designed to provide electrical power to a building. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

**BEDRIDDEN PERSON.** A person, requiring assistance in turning and repositioning in bed, or being unable to independently transfer to and from bed, except in facilities with appropriate and sufficient care staff, mechanical devices if necessary, and safety precautions as determined in Title 22 regulations, by the Director of Social Services or his or her designated representative. Persons who are unable to independently transfer to and from bed, but who do not need assistance to turn or reposition in bed, shall be considered nonambulatory.

The Director of Social Services or his or her designated representative shall make the determination of the bedridden status of persons with developmental disabilities, in consulta-

tion with the Director of Developmental Services or his or her designated representative.

The Director of Social Services or his or her designated representative shall make the determination of the bedridden status of all other persons with disabilities who are not developmentally disabled.

**[RB] BOND BEAM.** A horizontal grouted element within masonry in which reinforcement is embedded.

**[RB] BRACED WALL LINE.** A straight line through the building plan that represents the location of the lateral resistance provided by the wall bracing.

**[RB] BRACED WALL LINE, CONTINUOUSLY SHEATHED.** A braced wall line with structural sheathing applied to all sheathable surfaces including the areas above and below openings.

**[RB] BRACED WALL PANEL.** A full-height section of wall constructed to resist in-plane shear loads through interaction of framing members, sheathing material and anchors. The panel's length meets the requirements of its particular bracing method, and contributes toward the total amount of bracing required along its braced wall line in accordance with Section R602.10.1.

**[RB] BUILDING.** Building shall mean any one- and two-family dwelling or portion thereof, including townhouses, that is used, or designed or intended to be used for human habitation, for living, sleeping, cooking or eating purposes, or any combination thereof, and shall include accessory structures thereto.

**Exceptions:** For applications listed in Section 1.8.2 regulated by the Department of Housing and Community Development, "Building" shall not include the following:

1. Any mobilehome as defined in Health and Safety Code Section 18008.
2. Any manufactured home as defined in Health and Safety Code Section 18007.
3. Any commercial modular as defined in Health and Safety Code Section 18001.8 or any special purpose commercial modular as defined in Section 18012.5.
4. Any recreational vehicle as defined in Health and Safety Code Section 18010.
5. Any multifamily manufactured home as defined in Health and Safety Code Section 18008.7.

For additional information, see Health and Safety Code Section 18908.

**Note:** Building shall have the same meaning as defined in Health and Safety Code Sections 17920 and 18908 for the applications specified in Section 1.11.

**[RB] BUILDING, EXISTING.** Existing building is a building erected prior to the adoption of this code, or one for which a legal building permit has been issued.

**[RB] BUILDING-INTEGRATED PHOTOVOLTAIC PRODUCT.** A building product that incorporates photovoltaic modules and functions as a component of the building envelope.

**[RB] BUILDING LINE.** The line established by law, beyond which a building shall not extend, except as specifically provided by law.

destroying the glazing material; and with a surface, or assembly into which it is incorporated, that is divided into segments.

**DEPARTMENT.** *The Department of Housing and Community Development.*

**DESIGN PROFESSIONAL.** See “Registered design professional.”

**DIAMETER.** Unless specifically stated, the term “diameter” is the nominal diameter as designated by the approved material standard.

**[RB] DIAPHRAGM.** A horizontal or nearly horizontal system acting to transmit lateral forces to the vertical resisting elements. Where the term “diaphragm” is used, it includes horizontal bracing systems.

**[RB] DRAFT STOP.** A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor-ceiling assemblies, roof-ceiling assemblies and attics.

**DUCT SYSTEM.** *All ducts, duct fittings, plenums and fans when assembled to form a continuous passageway for the distribution of air.*

**[RB] DWELLING.** Any building that contains one or two dwelling units used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.

**[RB] DWELLING UNIT.** A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

**[RB] EMERGENCY ESCAPE AND RESCUE OPENING.** An operable exterior window, door or similar device that provides for a means of escape and access for rescue in the event of an emergency.

**ENFORCEMENT.** *Notwithstanding other provisions of law, the applicable section of the Health and Safety Code, Section 17920, is repeated here for clarity:*

*“Enforcement” means diligent effort to secure compliance, including review of plans and permit applications, response to complaints, citation of violations, and other legal process. Except as otherwise provided in this part, “enforcement” may, but need not, include inspections of existing buildings on which no complaint or permit application has been filed, and effort to secure compliance as to these existing buildings.*

**ENFORCEMENT AGENCY.** See “ENFORCING AGENCY.”

**ENFORCING AGENCY.** *The designated department or agency as specified by statute or regulation.*

**[RB] ENGINEERED WOOD RIM BOARD.** A full-depth structural composite lumber, wood structural panel, structural glued laminated timber or prefabricated wood I-joint member designed to transfer horizontal (shear) and vertical (compression) loads, provide attachment for diaphragm sheathing, sid-

ing and exterior deck ledgers and provide lateral support at the ends of floor or roof joists or rafters.

**[RB] ESCARPMENT.** With respect to topographic wind effects, a cliff or steep slope generally separating two levels or gently sloping areas.

**[RB] EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS).** EIFS are nonstructural, nonload-bearing exterior wall cladding systems that consist of an insulation board attached either adhesively or mechanically, or both, to the substrate; an integrally reinforced base coat; and a textured protective finish coat.

**[RB] EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE.** An EIFS that incorporates a means of drainage applied over a water-resistive barrier.

**[RB] EXTERIOR WALL.** An above-grade wall that defines the exterior boundaries of a building. Includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and basement walls with an average below-grade wall area that is less than 50 percent of the total opaque and nonopaque area of that enclosing side.

**[RB] EXTERIOR WALL COVERING.** A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resistive barrier, insulation or for aesthetics, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices, soffits, and fascias.

**[RB] FACING.** The wood structural panel facings that form the two outmost rigid layers of the structural insulated panel.

**FACTORY-BUILT CHIMNEY.** A listed and labeled chimney composed of factory-made components assembled in the field in accordance with the manufacturer’s instructions and the conditions of the listing.

**FAMILY. (HCD 1)** *An individual or two or more persons who are related by blood or marriage; or otherwise live together in a dwelling unit.*

**FENESTRATION.** See “Fenestration Product” as defined in the California Energy Code.

**FIBER-CEMENT (BACKERBOARD, SIDING, SOFFIT, TRIM AND UNDERLAYMENT) PRODUCTS.** Manufactured thin section composites of hydraulic cementitious matrices and discrete nonasbestos fibers.

**FIREBLOCKING.** Building materials or materials approved for use as fireblocking, installed to resist the free passage of flame to other areas of the building through concealed spaces.

**[RB] FIREPLACE.** An assembly consisting of a hearth and fire chamber of noncombustible material and provided with a chimney, for use with solid fuels.

**Factory-built fireplace.** A listed and labeled fireplace and chimney system composed of factory-made components,

## DEFINITIONS

and assembled in the field in accordance with manufacturer's instructions and the conditions of the listing.

**Masonry fireplace.** A field-constructed fireplace composed of solid masonry units, bricks, stones or concrete.

**FIREPLACE STOVE.** A free-standing, chimney-connected solid-fuel-burning heater designed to be operated with the fire chamber doors in either the open or closed position.

**[RB] FIREPLACE THROAT.** The opening between the top of the firebox and the smoke chamber.

**[RB] FIRE-RETARDANT-TREATED WOOD.** Pressure-treated lumber and plywood that exhibit reduced surface burning characteristics and resist propagation of fire.

**Other means during manufacture.** A process where the wood raw material is treated with a fire-retardant formulation while undergoing creation as a finished product.

**Pressure process.** A process for treating wood using an initial vacuum followed by the introduction of pressure above atmospheric.

**[RB] FIRE SEPARATION DISTANCE.** The distance measured from the building face to one of the following:

1. To the closest interior lot line.
2. To the centerline of a street, an alley or public way.
3. To an imaginary line between two buildings on the lot.

The distance shall be measured at a right angle from the face of the wall.

**FIXTURE.** See "Plumbing fixture."

**[RB] FLAME SPREAD.** The propagation of flame over a surface.

**[RB] FLAME SPREAD INDEX.** A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E84 or UL 723.

**[RB] FLIGHT.** A continuous run of rectangular treads or winders or combination thereof from one landing to another.

**FLUE.** See "Vent."

**FLUE GASES.** Products of combustion plus excess air in appliance flues or heat exchangers.

**[RB] FOAM BACKER BOARD.** Foam plastic used in siding applications where the foam plastic is a component of the siding.

**[RB] FOAM PLASTIC INSULATION.** A plastic that is intentionally expanded by the use of a foaming agent to produce a reduced-density plastic containing voids consisting of open or closed cells distributed throughout the plastic for thermal insulating or acoustic purposes and that has a density less than 20 pounds per cubic foot (320 kg/m<sup>3</sup>) unless it is used as interior trim.

**[RB] FOAM PLASTIC INTERIOR TRIM.** Exposed foam plastic used as picture molds, chair rails, crown moldings, baseboards, handrails, ceiling beams, door trim and window

trim and similar decorative or protective materials used in fixed applications.

**FULL-TIME CARE** shall mean the establishment and routine care of persons on an hourly, daily, weekly, monthly, yearly or permanent basis, whether for 24-hours per day or less, and where sleeping accommodations are provided.

**[RB] GLAZING AREA.** The interior surface area of all glazed fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Includes the area of glazed fenestration assemblies in walls bounding conditioned basements.

**[RB] GRADE.** The finished ground level adjoining the building at all exterior walls.

**[RB] GRADE FLOOR OPENING.** A window or other opening located such that the sill height of the opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.

**[RB] GRADE PLANE.** A reference plane representing the average of the finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1829 mm) from the building between the structure and a point 6 feet (1829 mm) from the building.

**[RB] GROSS AREA OF EXTERIOR WALLS.** The normal projection of all exterior walls, including the area of all windows and doors installed therein.

**[RB] GUARD OR GUARDRAIL.** A building component or a system of building components located near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to the lower level.

**[RB] GUESTROOM.** Any room or rooms used or intended to be used by one or more guests for living or sleeping purposes.

**[RB] GYPSUM BOARD.** The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing. Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board and water-resistant gypsum backing board complying with the standards listed in Section R702.3 and Part IX of this code are types of gypsum board.

**[RB] GYPSUM PANEL PRODUCT.** The general name for a family of sheet products consisting essentially of gypsum.

**[RB] HABITABLE SPACE.** A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces.

**[RB] HANDRAIL.** A horizontal or sloping rail intended for grasping by the hand for guidance or support.

**HANGERS.** See "Supports."

## CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE CHAPTER 3 – BUILDING PLANNING

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
<i>R300</i>				X																	
<i>R300.1</i>				X																	
<i>R300.2</i>				X																	
R301.1			X																		
<i>R301.1.1.1</i>				X																	
<i>R301.1.3.1</i>				X																	
<i>R301.1.3.2</i>				X																	
<i>R301.1.3.3</i>				X																	
Table R301.2(1)				X																	
R301.2.2.1.1																					
R301.2.2.1.2																					
R301.2.2.3.7				X																	
R302.1 - R302.14			X																		
R302.1				X																	
R302.2				X																	
R302.5.1				X																	
R302.6				X																	
R302.14				X																	
R303.1				X																	
R303.3				X																	
<i>R303.3.1</i>				X																	
R303.4				X																	
R303.7 - R308.1			X																		
<i>R303.8.1.1</i>				X																	
R303.9				X																	
R304.2				X																	
R307.1				X																	
Figure R307.1				†																	
R308.3 - R308.4			X																		
R309.4				X																	
R309.5			X																		
<i>R309.6</i>			X																		
<i>R309.7</i>				X																	
<i>R309.8</i>				X																	
R310 - R310.4			X																		

(continued)

**CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE  
CHAPTER 3 – BUILDING PLANNING—continued**

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt Entire Chapter																					
Adopt Entire Chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R310.2.2				X																	
R311 - R311.8.3.3			X																		
R312 - R312.2.2			X																		
R312.1.2				X																	
R313 - R313.3.8.2			X	◆																	
R314 - R314.8.3			X																		
R315.1.1				X																	
R315.2				X																	
R315.2.1				X																	
R315.2.2				X																	
R315.3				X																	
R315.4				X																	
R315.5				X																	
R315.6.2				X																	
R315.6.4				X																	
R315.7				X																	
R316			X																		
R319			X																		
R320.1				X																	
R320.1.1				†																	
R321			X																		
R321.3				X																	
R322.1.6				X																	
R322.1.7				X																	
R322.1.9				†																	
R324			X																		
R324.2				X																	
R324.3				X																	
R324.6.1				X																	
R324.7.2.5 Exception				X																	
R326				†																	
R334				X																	
R334.1				X																	
R335 - R335.9			X																		
R336 - R336.8			X																		
R337 - R337.10.4			X																		
R338 - R338.4			X																		
R340				X																	
R340.1				X																	

The state agency does not adopt sections identified with the following symbol: †

The ◆ designation indicates that the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures subject to HCD 1.



drainage, piping and similar openings or penetrations shall be permitted.

**Exceptions:**

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section R313, NFPA 13D, or other approved equivalent sprinkler system.
2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.
3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:
  - 3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m<sup>2</sup>) per story.
  - 3.2. Fireblocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.
4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

**R302.14 Combustible insulation clearance.** Combustible insulation shall be separated not less than 3 inches (76 mm) from recessed luminaires, fan motors and other heat-producing devices.

**Exception:** Where heat-producing devices are listed for lesser clearances, combustible insulation complying with the listing requirements shall be separated in accordance with the conditions stipulated in the listing.

Recessed luminaires installed in the *building envelope* shall meet or exceed the requirements specified in the *California Energy Code for recessed luminaires installed in insulated ceilings*.

## SECTION R303 LIGHT, VENTILATION AND HEATING

**R303.1 Habitable rooms.** Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.

**Exceptions:**

1. The glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical ventilation system is installed in accordance with the *California Mechanical Code*.
2. The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is

provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

3. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural ventilation if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.
4. *The windows, doors, louvers and other approved closeable openings not required by Section R310 may open into a passive solar energy collector for ventilation required by this section. The area of ventilation openings to the outside of the passive solar energy collector shall be increased to compensate for the openings required by the interior space.*
5. *Glazed openings may open into a passive solar energy collector provided the area of exterior glazed opening(s) into the passive solar energy collector is increased to compensate for the area required by the interior space.*

**R303.2 Adjoining rooms.** For the purpose of determining light and ventilation requirements, any room shall be considered to be a portion of an adjoining room where not less than one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room and not less than 25 square feet (2.3 m<sup>2</sup>).

**Exception:** Openings required for light or ventilation shall be permitted to open into a sunroom with thermal isolation or a patio cover, provided that there is an openable area between the adjoining room and the sunroom or patio cover of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (2 m<sup>2</sup>). The minimum openable area to the outdoors shall be based upon the total floor area being ventilated.

**R303.3 Bathrooms.** Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m<sup>2</sup>), one-half of which must be openable.

**Exception:** The glazed areas shall not be required where artificial light and a local exhaust system are provided. The minimum local exhaust rates shall be *50 cubic feet per minute (25 L/s) for intermittent ventilation or 20 cubic feet per minute (10 L/s) for continuous ventilation* in accordance with the *California Mechanical Code, Chapter 4*. Exhaust air from the space shall be exhausted directly to the outdoors.

**R303.3.1 Bathroom exhaust fans.** *Each bathroom containing a bathtub, shower or tub/shower combination shall be mechanically ventilated for purposes of humidity control in accordance with the California Mechanical Code, Chapter 4; and the California Green Building Standards Code, Chapter 4, Division 4.5.*

**Note:** *Window operation is not a permissible method of providing bathroom exhaust for humidity control.*

**R303.4 Ventilation.** *Ventilation air rates shall be in compliance with the California Mechanical Code.*

**R303.5 Opening location.** Outdoor intake and exhaust openings shall be located in accordance with Sections R303.5.1 and R303.5.2.

**R303.5.1 Intake openings.** Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks.

For the purpose of this section, the exhaust from dwelling unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

**Exceptions:**

1. The 10-foot (3048 mm) separation is not required where the intake opening is located 3 feet (914 mm) or greater below the contaminant source.
2. Vents and chimneys serving fuel-burning appliances shall be terminated in accordance with the applicable provisions of Chapters 18 and 24.
3. Clothes dryer exhaust ducts shall be terminated in accordance with Section M1502.3.

**R303.5.2 Exhaust openings.** Exhaust air shall not be directed onto walkways.

**R303.6 Outside opening protection.** Air exhaust and intake openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles having an opening size of not less than 1/4 inch (6 mm) and a maximum opening size of 1/2 inch (13 mm), in any dimension. Openings shall be protected against local weather conditions. Outdoor air exhaust and intake openings shall meet the provisions for exterior wall opening protectives in accordance with this code.

**R303.7 Interior stairway illumination.** Interior stairways shall be provided with an artificial light source to illuminate the landings and treads. The light source shall be capable of illuminating treads and landings to levels of not less than 1 foot-candle (11 lux) as measured at the center of treads and landings. There shall be a wall switch at each floor level to control the light source where the stairway has six or more risers.

**Exception:** A switch is not required where remote, central or automatic control of lighting is provided.

**R303.8 Exterior stairway illumination.** Exterior stairways shall be provided with an artificial light source located at the top landing of the stairway. Exterior stairways providing

access to a basement from the outdoor grade level shall be provided with an artificial light source located at the bottom landing of the stairway.

**R303.8.1 Sunroom additions.** Required glazed openings shall be permitted to open into sunroom additions or patio covers that abut a street, yard or court if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening, and the ceiling height of the sunroom is not less than 7 feet (2134 mm).

**R303.8.1.1 Passive solar energy collectors.** *When a passive solar energy collector is designed as a conditioned area it shall comply with the California Energy Code. Nonconditioned passive solar energy collectors are exempt from the California Energy Code.*

**R303.9 Required heating.** Where the winter design temperature in Table R301.2(1) is below 60°F (16°C), every dwelling unit shall be provided with heating facilities capable of maintaining a room temperature of not less than 68°F (20°C) at a point 3 feet (914 mm) above the floor and 2 feet (610 mm) from exterior walls in habitable rooms at the design temperature. The installation of one or more portable space heaters shall not be used to achieve compliance with this section.

*Note: See Section R301.1.1.1 for limited-density owner-built rural dwellings.*

**SECTION R304  
MINIMUM ROOM AREAS**

**R304.1 Minimum area.** Habitable rooms shall have a floor area of not less than 70 square feet (6.5 m<sup>2</sup>).

**Exceptions:** Kitchens.

**R304.2 Minimum dimensions.** Habitable rooms shall be not less than 7 feet (2134 mm) in any horizontal dimension.

**Exceptions:**

1. Kitchens.
2. Limited-density owner-built rural dwellings. See Section R301.1.1.1.

**R304.3 Height effect on room area.** Portions of a room with a sloping ceiling measuring less than 5 feet (1524 mm) or a furred ceiling measuring less than 7 feet (2134 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.



### SECTION R305 CEILING HEIGHT

**R305.1 Minimum height.** Habitable space, hallways and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

#### Exceptions:

1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 7 feet (2134 mm).
2. The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches (2032 mm) above an area of not less than 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.
3. Beams, girders, ducts or other obstructions in basements containing habitable space shall be permitted to project to within 6 feet 4 inches (1931 mm) of the finished floor.

**R305.1.1 Basements.** Portions of basements that do not contain habitable space or hallways shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

**Exception:** At beams, girders, ducts or other obstructions, the ceiling height shall be not less than 6 feet 4 inches (1931 mm) from the finished floor.

### SECTION R306 SANITATION

**R306.1 Toilet facilities.** Every dwelling unit shall be provided with a water closet, lavatory, and a bathtub or shower.

**R306.2 Kitchen.** Each dwelling unit shall be provided with a kitchen area and every kitchen area shall be provided with a sink.

**R306.3 Sewage disposal.** Plumbing fixtures shall be connected to a sanitary sewer or to an approved private sewage disposal system.

**R306.4 Water supply to fixtures.** Plumbing fixtures shall be connected to an approved water supply. Kitchen sinks, lavatories, bathtubs, showers, bidets, laundry tubs and washing machine outlets shall be provided with hot and cold water.

### SECTION R307 TOILET, BATH AND SHOWER SPACES

**R307.1 Space required.** Fixtures shall be spaced in accordance with the *California Plumbing Code*.

**R307.2 Bathtub and shower spaces.** Bathtub and shower floors and walls above bathtubs with installed shower heads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6 feet (1829 mm) above the floor.

### SECTION R308 GLAZING

**R308.1 Identification.** Except as indicated in Section R308.1.1 each pane of glazing installed in hazardous locations as defined in Section R308.4 shall be provided with a manufacturer's designation specifying who applied the designation, designating the type of glass and the safety glazing standard with which it complies, which is visible in the final installation. The designation shall be acid etched, sandblasted, ceramic-fired, laser etched, embossed, or be of a type that once applied cannot be removed without being destroyed. A label shall be permitted in lieu of the manufacturer's designation.

#### Exceptions:

1. For other than tempered glass, manufacturer's designations are not required provided that the building official approves the use of a certificate, affidavit or other evidence confirming compliance with this code.
2. Tempered spandrel glass is permitted to be identified by the manufacturer with a removable paper designation.

**R308.1.1 Identification of multiple assemblies.** Multi-pane assemblies having individual panes not exceeding 1 square foot (0.09 m<sup>2</sup>) in exposed area shall have not less than one pane in the assembly identified in accordance with Section R308.1. Other panes in the assembly shall be labeled "CPSC 16 CFR 1201" or "ANSI Z97.1" as appropriate.

**R308.2 Louvered windows or jalousies.** Regular, float, wired or patterned glass in jalousies and louvered windows shall be not less than nominal  $\frac{3}{16}$  inch (5 mm) thick and not more than 48 inches (1219 mm) in length. Exposed glass edges shall be smooth.

**R308.2.1 Wired glass prohibited.** Wired glass with wire exposed on longitudinal edges shall not be used in jalousies or louvered windows.

**R308.3 Human impact loads.** Individual glazed areas, including glass mirrors in hazardous locations such as those indicated as defined in Section R308.4, shall pass the test requirements of Section R308.3.1.

**Exceptions:**

1. Louvered windows and jalousies shall comply with Section R308.2.
2. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.
3. Glass unit masonry complying with Section R607.

**R308.3.1 Impact test.** Where required by other sections of the code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category II unless otherwise indicated in Table R308.3.1(1).

**Exception:** Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A unless indicated in Table R308.3.1(2).

**R308.4 Hazardous locations.** The locations specified in Sections R308.4.1 through R308.4.7 shall be considered to be specific hazardous locations for the purposes of glazing.

**R308.4.1 Glazing in doors.** Glazing in fixed and operable panels of swinging, sliding and bifold doors shall be considered to be a hazardous location.

**Exceptions:**

1. Glazed openings of a size through which a 3-inch-diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.

**R308.4.2 Glazing adjacent to doors.** Glazing in an individual fixed or operable panel adjacent to a door shall be considered to be a hazardous location where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the floor or walking surface and it meets either of the following conditions:

1. Where the glazing is within 24 inches (610 mm) of either side of the door in the plane of the door in a closed position.
2. Where the glazing is on a wall perpendicular to the plane of the door in a closed position and within 24 inches (610 mm) of the hinge side of an in-swinging door.

**Exceptions:**

1. Decorative glazing.
2. Where there is an intervening wall or other permanent barrier between the door and the glazing.
3. Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with Section R308.4.3.
4. Glazing that is adjacent to the fixed panel of patio doors.

**R308.4.3 Glazing in windows.** Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered to be a hazardous location:

1. The exposed area of an individual pane is larger than 9 square feet (0.836 m<sup>2</sup>),
2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor,
3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and

**TABLE R308.3.1(1)**  
**MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING CPSC 16 CFR 1201**

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZING IN STORM OR COMBINATION DOORS (Category Class)	GLAZING IN DOORS (Category Class)	GLAZED PANELS REGULATED BY SECTION R308.4.3 (Category Class)	GLAZED PANELS REGULATED BY SECTION R308.4.2 (Category Class)	GLAZING IN DOORS AND ENCLOSURES REGULATED BY SECTION 308.4.5 (Category Class)	SLIDING GLASS DOORS PATIO TYPE (Category Class)
9 square feet or less	I	I	NR	I	II	II
More than 9 square feet	II	II	II	II	II	II

For SI: 1 square foot = 0.0929 m<sup>2</sup>.  
NR = "No Requirement."

**TABLE R308.3.1(2)**  
**MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1**

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZED PANELS REGULATED BY SECTION R308.4.3 (Category Class)	GLAZED PANELS REGULATED BY SECTION R308.4.2 (Category Class)	DOORS AND ENCLOSURES REGULATED BY SECTION R308.4.5 <sup>a</sup> (Category Class)
9 square feet or less	No requirement	B	A
More than 9 square feet	A	A	A

For SI: 1 square foot = 0.0929 m<sup>2</sup>.  
a. Use is permitted only by the exception to Section R308.3.1.

**R311.7.10.1 Spiral stairways.** Spiral stairways are permitted, provided that the clear width at and below the handrail is not less than 26 inches (660 mm) and the walkline radius is not greater than 24½ inches (622 mm). Each tread shall have a depth of not less than 6¾ inches (171 mm) at the walkline. All treads shall be identical, and the rise shall be not more than 9½ inches (241 mm). Headroom shall be not less than 6 feet 6 inches (1982 mm).

**R311.7.10.2 Bulkhead enclosure stairways.** Stairways serving bulkhead enclosures, not part of the required building egress, providing access from the outside grade level to the basement shall be exempt from the requirements of Sections R311.3 and R311.7 where the height from the basement finished floor level to grade adjacent to the stairway is not more than 8 feet (2438 mm) and the grade level opening to the stairway is covered by a bulkhead enclosure with hinged doors or other approved means.

**R311.7.11 Alternating tread devices.** Alternating tread devices shall not be used as an element of a means of egress. Alternating tread devices shall be permitted provided that the required means of egress stairway or ramp serves the same space at each adjoining level or where a means of egress is not required. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

**R311.7.11.1 Treads of alternating tread devices.** Alternating tread devices shall have a tread depth of not less than 5 inches (127 mm), a projected tread depth of not less than 8½ inches (216 mm), a tread width of not less than 7 inches (178 mm) and a riser height of not more than 9½ inches (241 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projections of adjacent treads. The riser height shall be measured vertically between the leading edges of adjacent treads. The riser height and tread depth provided shall result in an angle of ascent from the horizontal of between 50 and 70 degrees (0.87 and 1.22 rad). The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

**R311.7.11.2 Handrails of alternating tread devices.** Handrails shall be provided on both sides of alternating tread devices and shall comply with Sections R311.7.8.2 to R311.7.8.4. Handrail height shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

**R311.7.12 Ships ladders.** Ships ladders shall not be used as an element of a means of egress. Ships ladders shall be permitted provided that a required means of egress stairway or ramp serves the same space at each adjoining level or where a means of egress is not required. The clear width at and below the handrails shall be not less than 20 inches.

**R311.7.12.1 Treads of ships ladders.** Treads shall have a depth of not less than 5 inches (127 mm). The

tread shall be projected such that the total of the tread depth plus the nosing projection is not less than 8½ inches (216 mm). The riser height shall be not more than 9½ inches (241 mm).

**R311.7.12.2 Handrails of ships ladders.** Handrails shall be provided on both sides of ships ladders and shall comply with Sections R311.7.8.2 to R311.7.8.4. Handrail height shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

### R311.8 Ramps.

**R311.8.1 Maximum slope.** Ramps serving the egress door required by Section R311.2 shall have a slope of not more than 1 unit vertical in 12 units horizontal (8.3-percent slope). All other ramps shall have a maximum slope of 1 unit vertical in 8 units horizontal (12.5 percent).

**Exception:** Where it is technically infeasible to comply because of site constraints, ramps shall have a slope of not more than 1 unit vertical in 8 units horizontal (12.5 percent).

**R311.8.2 Landings required.** There shall be a floor or landing at the top and bottom of each ramp, where doors open onto ramps, and where ramps change directions. The width of the landing perpendicular to the ramp slope shall be not less than 36 inches (914 mm).

**R311.8.3 Handrails required.** Handrails shall be provided on not less than one side of ramps exceeding a slope of one unit vertical in 12 units horizontal (8.33-percent slope).

**R311.8.3.1 Height.** Handrail height, measured above the finished surface of the ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

**R311.8.3.2 Grip size.** Handrails on ramps shall comply with Section R311.7.8.3.

**R311.8.3.3 Continuity.** Handrails where required on ramps shall be continuous for the full length of the ramp. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1½ inches (38 mm) between the wall and the handrails.

## SECTION R312 GUARDS AND WINDOW FALL PROTECTION

**R312.1 Guards.** Guards shall be provided in accordance with Sections R312.1.1 through R312.1.4.

**R312.1.1 Where required.** Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard.

**R312.1.2 Height.** Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than *42 inches (1067 mm)* in height as measured vertically above the adjacent walking surface or the line connecting the leading edges of the treads.

**Exceptions:**

1. Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. Where the top of the guard serves as a handrail on the open sides of stairs, the top of the guard shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) as measured vertically from a line connecting the leading edges of the treads.

**R312.1.3 Opening limitations.** Required guards shall not have openings from the walking surface to the required guard height that allow passage of a sphere 4 inches (102 mm) in diameter.

**Exceptions:**

1. The triangular openings at the open side of stair, formed by the riser, tread and bottom rail of a guard, shall not allow passage of a sphere 6 inches (153 mm) in diameter.
2. Guards on the open side of stairs shall not have openings that allow passage of a sphere  $4\frac{3}{8}$  inches (111 mm) in diameter.

**R312.1.4 Exterior plastic composite guards.** Plastic composite exterior guards shall comply with the requirements of Section R317.4.

**R312.2 Window fall protection.** Window fall protection shall be provided in accordance with Sections R312.2.1 and R312.2.2.

**R312.2.1 Window sills.** In dwelling units, where the top of the sill of an operable window opening is located less than 24 inches (610 mm) above the finished floor and greater than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, the operable window shall comply with one of the following:

1. Operable windows with openings that will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening where the opening is in its largest opened position.
2. Operable windows that are provided with window fall prevention devices that comply with ASTM F2090.
3. Operable windows that are provided with window opening control devices that comply with Section R312.2.2.

**R312.2.2 Window opening control devices.** Window opening control devices shall comply with ASTM F2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the net clear opening area of the window unit to less than the area required by Section R310.2.1.

## SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS

**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in townhouses.

**Exception:** An automatic residential fire sprinkler system shall not be required where additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.

**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with Section R313.3 or NFPA 13D.

**R313.2 One- and two-family dwellings automatic fire systems.** An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.

**Exceptions:**

1. An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with an automatic residential sprinkler system.
2. *Accessory Dwelling Unit, provided that all of the following are met:*
  - 2.1. *The unit meets the definition of an Accessory Dwelling Unit as defined in the Government Code Section 65852.2.*
  - 2.2. *The existing primary residence does not have automatic fire sprinklers.*
  - 2.3. *The accessory detached dwelling unit does not exceed 1,200 square feet in size.*
  - 2.4. *The unit is on the same lot as the primary residence.*

**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section R313.3 or NFPA 13D.

**R313.3 Dwelling unit fire sprinkler systems.**

**R313.3.1 General.** The design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section R313.3, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section R313.3 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of anti-freeze. A multipurpose fire sprinkler system shall supply domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system.

**R313.3.1.1 Backflow protection.** A backflow preventer shall not be required to separate a sprinkler system from the water distribution system, provided that:

1. *The system complies with NFPA 13D or Section R313;*
2. *Piping materials are suitable for potable water in accordance with the California Plumbing Code; and*
3. *The system does not contain antifreeze or have a fire department connection.*

**R313.3.1.2 Required sprinkler locations.** Sprinklers shall be installed to protect all areas of a dwelling unit.

**Exceptions:**

1. Attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m<sup>2</sup>) in area, with the smallest dimension not greater than 3 feet (915 mm) and having wall and ceiling surfaces of gypsum board.
3. Bathrooms not more than 55 square feet (5.1 m<sup>2</sup>) in area.
4. Detached garages; carports with no habitable space above; open attached porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

**R313.3.2 Sprinklers.** Sprinklers shall be new listed residential sprinklers and shall be installed in accordance with the sprinkler manufacturer's installation instructions.

**R313.3.2.1 Temperature rating and separation from heat sources.** Except as provided for in Section R313.3.2.2, sprinklers shall have a temperature rating of not less than 135°F (57°C) and not more than 170°F (77°C). Sprinklers shall be separated from heat sources as required by the sprinkler manufacturer's installation instructions.

**R313.3.2.2 Intermediate temperature sprinklers.** Sprinklers shall have an intermediate temperature rating not less than 175°F (79°C) and not more than 225°F (107°C) where installed in the following locations:

1. Directly under skylights, where the sprinkler is exposed to direct sunlight.
2. In attics.
3. In concealed spaces located directly beneath a roof.
4. Within the distance to a heat source as specified in Table R313.3.2.2.

**R313.3.2.3 Freezing areas.** Piping shall be protected from freezing as required by the *California Plumbing Code*. Where sprinklers are required in areas that are subject to freezing, dry-sidewall or dry-pendent sprinklers extending from a nonfreezing area into a freezing area shall be installed. *Where fire sprinkler piping cannot be adequately protected against freezing, the system shall be designed and installed in accordance with NFPA 13D.*

**R313.3.2.4 Sprinkler coverage.** Sprinkler coverage requirements and sprinkler obstruction requirements shall be in accordance with Sections R313.3.2.4.1 and R313.3.2.4.2.

**R313.3.2.4.1 Coverage area limit.** The area of coverage of a single sprinkler shall not exceed 400

square feet (37 m<sup>2</sup>) and shall be based on the sprinkler listing and the sprinkler manufacturer's installation instructions.

**TABLE R313.3.2.2  
LOCATIONS WHERE INTERMEDIATE  
TEMPERATURE SPRINKLERS ARE REQUIRED**

HEAT SOURCE	RANGE OF DISTANCE FROM HEAT SOURCE WITHIN WHICH INTERMEDIATE TEMPERATURE SPRINKLERS ARE REQUIRED <sup>a,b</sup> (inches)
Fireplace, side of open or recessed fireplace	12 to 36
Fireplace, front of recessed fireplace	36 to 60
Coal and wood burning stove	12 to 42
Kitchen range top	9 to 18
Oven	9 to 18
Vent connector or chimney connector	9 to 18
Heating duct, not insulated	9 to 18
Hot water pipe, not insulated	6 to 12
Side of ceiling or wall warm air register	12 to 24
Front of wall mounted warm air register	18 to 36
Water heater, furnace or boiler	3 to 6
Luminaire up to 250 watts	3 to 6
Luminaire 250 watts up to 499 watts	6 to 12

For SI: 1 inch = 25.4 mm.

- a. Sprinklers shall not be located at distances less than the minimum table distance unless the sprinkler listing allows a lesser distance.
- b. Distances shall be measured in a straight line from the nearest edge of the heat source to the nearest edge of the sprinkler.

**R313.3.2.4.2 Obstructions to coverage.** Sprinkler discharge shall not be blocked by obstructions unless additional sprinklers are installed to protect the obstructed area. Additional sprinklers shall not be required where the sprinkler separation from obstructions complies with either the minimum distance indicated in Figure R313.3.2.4.2 or the minimum distances specified in the sprinkler manufacturer's instructions where the manufacturer's instructions permit a lesser distance.

**R313.3.2.4.2.1 Additional requirements for pendent sprinklers.** Pendent sprinklers within 3 feet (915 mm) of the center of a ceiling fan, surface-mounted ceiling luminaire or similar object shall be considered to be obstructed, and additional sprinklers shall be installed.

**R313.3.2.4.2.2 Additional requirements for sidewall sprinklers.** Sidewall sprinklers within 5 feet (1524 mm) of the center of a ceiling fan, surface-mounted ceiling luminaire or similar object shall be considered to be obstructed, and additional sprinklers shall be installed.

**R313.3.2.5 Sprinkler installation on systems assembled with solvent cement.** The solvent cementing of threaded adapter fittings shall be completed and threaded adapters for sprinklers shall be verified as



being clear of excess cement prior to the installation of sprinklers on systems assembled with solvent cement.

**R313.3.2.6 Sprinkler modifications prohibited.** Painting, caulking or modifying of sprinklers shall be prohibited. Sprinklers that have been painted, caulked, modified or damaged shall be replaced with new sprinklers.

**R313.3.3 Sprinkler piping system.** Sprinkler piping shall be supported in accordance with the requirements for cold water distribution piping. Sprinkler piping shall comply with all requirements for cold water distribution piping. For multipurpose piping systems, the sprinkler piping shall connect to and be a part of the cold water distribution piping system.

**Exception:** For plastic piping, it shall be permissible to follow the manufacturer's installation instructions.

**R313.3.3.1 Nonmetallic pipe and tubing.** Nonmetallic pipe and tubing, such as CPVC, PEX, and PE-RT shall be listed for use in residential fire sprinkler systems.

**R313.3.3.1.1 Nonmetallic pipe protection.** Nonmetallic pipe and tubing systems shall be protected from exposure to the living space by a layer of not less than  $\frac{3}{8}$  inch (9.5 mm) thick gypsum wallboard,  $\frac{1}{2}$  inch thick plywood (13 mm), or other material having a 15 minute fire rating.

**Exceptions:**

1. Pipe protection shall not be required in areas that do not require protection with sprinklers as specified in Section R313.3.1.2.
2. Pipe protection shall not be required where exposed piping is permitted by the pipe listing.

**R313.3.3.2 Shutoff valves prohibited.** With the exception of shutoff valves for the entire water distribution system, valves shall not be installed in any location where the valve would isolate piping serving one or more sprinklers.

**R313.3.3.3 Single dwelling limit.** Piping beyond the service valve located at the beginning of the water distribution system shall not serve more than one dwelling.

**R313.3.3.4 Drain.** A means to drain the sprinkler system shall be provided on the system side of the water distribution shutoff valve.

**R313.3.4 Determining system design flow.** The flow for sizing the sprinkler piping system shall be based on the flow rating of each sprinkler in accordance with Section R313.3.4.1 and the calculation in accordance with Section R313.3.4.2.

**R313.3.4.1 Determining required flow rate for each sprinkler.** The minimum required flow for each sprinkler shall be determined using the sprinkler manufacturer's published data for the specific sprinkler model based on all of the following:

1. The area of coverage.
2. The ceiling configuration.
3. The temperature rating.
4. Any additional conditions specified by the sprinkler manufacturer.

**R313.3.4.2 System design flow rate.** The design flow rate for the system shall be based on the following:

1. The design flow rate for a room having only one sprinkler shall be the flow rate required for that sprinkler, as determined by Section R313.3.4.1.
2. The design flow rate for a room having two or more sprinklers shall be determined by identifying the sprinkler in that room with the highest required flow rate, based on Section R313.3.4.1, and multiplying that flow rate by 2.
3. Where the sprinkler manufacturer specifies different criteria for ceiling configurations that are not smooth, flat and horizontal, the required flow rate for that room shall comply with the sprinkler manufacturer's instructions.
4. The design flow rate for the sprinkler system shall be the flow required by the room with the largest flow rate, based on Items 1, 2 and 3.
5. For the purpose of this section, it shall be permissible to reduce the design flow rate for a room by subdividing the space into two or more rooms, where each room is evaluated separately with respect to the required design flow rate. Each room shall be bounded by walls and a ceiling. Openings in walls shall have a lintel not less than 8 inches (203 mm) in depth and each lintel shall form a solid barrier between the ceiling and the top of the opening.

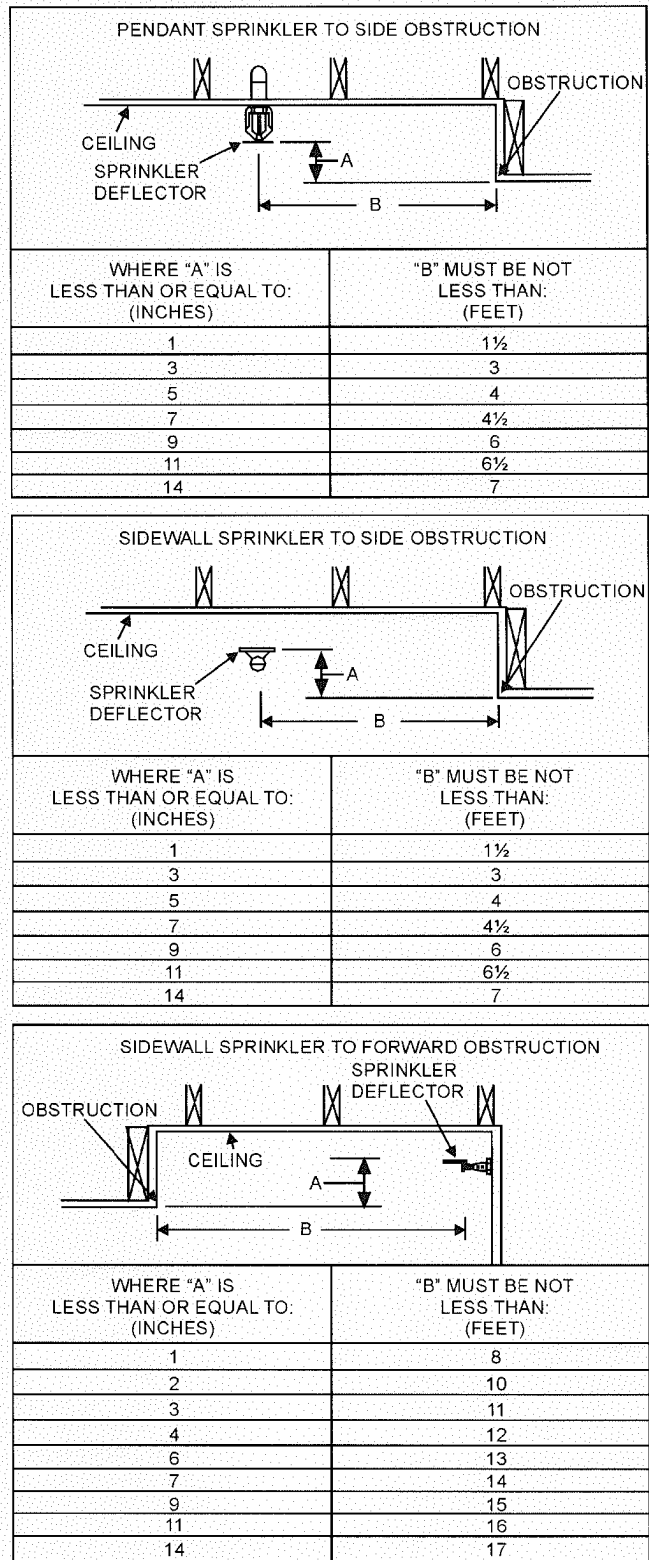
**R313.3.5 Water supply.** The water supply shall provide not less than the required design flow rate for sprinklers in accordance with Section R313.3.4.2 at a pressure not less than that used to comply with Section R313.3.6. *Where a water supply serves both domestic and fire sprinkler systems, 5 gpm (19 L/min) shall be added to the sprinkler system demand at the point where the systems are connected, to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler. For multipurpose piping systems, the 5 gpm (19 L/min) demand shall be added at the domestic connection nearest the design area. This demand may be split between two domestic connections at 2.5 gpm (10 L/min) each.*

**R313.3.5.1 Water supply from individual sources.**

Where a dwelling unit water supply is from a tank system, a private well system, a pump, or a combination of these, the available water supply shall be based on the minimum pressure control setting for the pump.

**R313.3.5.2 Required capacity.** The water supply shall have the capacity to provide the required design flow rate for sprinklers for a period of time as follows:

1. Seven minutes for dwelling units one story in height and less than 2,000 square feet (186 m<sup>2</sup>) in area. *For the purpose of determining the area of the dwelling unit, the area of attached garages and attached open carports, porches, balconies and patios shall not be included.*
2. Ten minutes for dwelling units two or more stories in height or equal to or greater than 2,000 square feet



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**FIGURE R313.3.2.4.2**  
**MINIMUM ALLOWABLE DISTANCE BETWEEN SPRINKLER AND OBSTRUCTION**



(186 m<sup>2</sup>) in area. For the purpose of determining the area of the dwelling unit, the area of attached garages and attached open carports, porches, balconies, and patios shall not be included.

**R313.3.5.2.1** Where a well system, a water supply tank system, a pump, or a combination thereof, is used, the configuration for the system shall be one of the following:

1. The water supply shall serve both domestic and fire sprinkler systems. Any combination of well capacity and tank storage shall be permitted to meet the capacity requirement.
2. A stand-alone tank is permitted if the following conditions are met:
  - 2.1. The pump shall be connected to a 220-volt circuit breaker shared with a common household appliance (e.g., range, oven, dryer),
  - 2.2. The pump shall be a stainless steel 240-volt pump,
  - 2.3. A valve shall be provided to exercise the pump. The discharge of the exercise valve shall be piped to the tank, and
  - 2.4. A sign shall be provided stating "Valve must be opened monthly for 5 minutes."
  - 2.5. A means for automatically refilling the tank level so that the tank capacity will meet the required water supply duration in minutes shall be provided.

**R313.3.5.3 Connections to automatic fire sprinkler systems.** The potable water supply to automatic fire sprinkler shall be protected against backflow by a double check backflow prevention assembly, a double check fire protection backflow prevention assembly, a reduced pressure principle backflow prevention assembly or a reduced pressure principle fire protection backflow prevention assembly.

**Exception:** Where permitted by Section R313.3.1.1, backflow protection for the water supply system shall not be required.

**R313.3.5.3.1 Additives or nonpotable source.** Where systems contain chemical additives or antifreeze, or where systems are connected to a nonpotable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly or a reduced pressure principle fire protection backflow prevention assembly. Where chemical additives or antifreeze is added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle fire protection backflow preventer shall be permitted to be located so as to isolate that portion of the system.

**R313.3.6 Pipe sizing.** The piping to sprinklers shall be sized for the flow required by Section R313.3.4.2. The flow required to supply the plumbing fixtures shall not be required to be added to the sprinkler design flow.

**R313.3.6.1 Method of sizing pipe.** Piping supplying sprinklers shall be sized using the prescriptive method

in Section R313.3.6.2 or by hydraulic calculation in accordance with NFPA 13D. The minimum pipe size from the water supply source to any sprinkler shall be 3/4 inch (19 mm) nominal. Threaded adapter fittings at the point where sprinklers are attached to the piping shall be a minimum of 1/2 inch (13 mm) nominal.

**R313.3.6.2 Prescriptive pipe sizing method.** Pipe shall be sized by determining the available pressure to offset friction loss in piping and identifying a piping material, diameter and length using the equation in Section R313.3.6.2.1 and the procedure in Section R313.3.6.2.2.

**R313.3.6.2.1 Available pressure equation.** The pressure available to offset friction loss in the interior piping system ( $P_i$ ) shall be determined in accordance with the Equation 29-1.

$$P_i = P_{sup} - PL_{svc} - PL_m - PL_d - PL_e - P_{sp} \quad \text{(Equation 29-1)}$$

where:

$P_i$  = Pressure used in applying Tables R313.3.6.2(4) through R313.3.6.2(9).

$P_{sup}$  = Pressure available from the water supply source.

$PL_{svc}$  = Pressure loss in the water-service pipe.

$PL_m$  = Pressure loss in the water meter.

$PL_d$  = Pressure loss from devices other than the water meter.

$PL_e$  = Pressure loss associated with changes in elevation.

$P_{sp}$  = Maximum pressure required by a sprinkler.

**R313.3.6.2.2 Calculation procedure.** Determination of the required size for water distribution piping shall be in accordance with the following procedure:

**Step 1 – Determine  $P_{sup}$**

Obtain the static supply pressure that will be available from the water main from the water purveyor, or for an individual source, the available supply pressure shall be in accordance with Section R313.3.5.1.

**Step 2 – Determine  $PL_{svc}$**

Use Table R313.3.6.2(1) to determine the pressure loss in the water service pipe based on the selected size of the water service.

**Step 3 – Determine  $PL_m$**

Use Table R313.3.6.2(2) to determine the pressure loss from the water meter, based on the selected water meter size.

**Step 4 – Determine  $PL_d$**

Determine the pressure loss from devices other than the water meter installed in the piping system supplying sprinklers, such as pressure-reducing valves, backflow preventers, water softeners or water filters. Device pressure losses shall be based on the device manufacturer's specifications. The flow rate used to determine pressure loss shall be the rate from Section R313.3.4.2, except that 5 gpm (0.3 L/S) shall be added where the device is installed in a water-service pipe that supplies more than one dwelling. As alternative to deducting pressure loss for a device, an automatic bypass valve shall be installed to divert flow around the device when a sprinkler activates.

local scour. Where soils are susceptible to erosion and local scour, stem wall foundations shall have deep footings to account for the loss of soil.

**R322.3.4 Walls below design flood elevation.** Walls and partitions are permitted below the elevated floor, provided that such walls and partitions are not part of the structural support of the building or structure and:

1. Electrical, mechanical and plumbing system components are not to be mounted on or penetrate through walls that are designed to break away under flood loads; and
2. Are constructed with insect screening or open lattice; or
3. Are designed to break away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Such walls, framing and connections shall have a resistance of not less than 10 (479 Pa) and not more than 20 pounds per square foot (958 Pa) as determined using allowable stress design; or
4. Where wind loading values of this code exceed 20 pounds per square foot (958 Pa), as determined using allowable stress design, the construction documents shall include documentation prepared and sealed by a registered design professional that:
  - 4.1. The walls and partitions below the design flood elevation have been designed to collapse from a water load less than that which would occur during the base flood.
  - 4.2. The elevated portion of the building and supporting foundation system have been designed to withstand the effects of wind and flood loads acting simultaneously on structural and nonstructural building components. Water-loading values used shall be those associated with the design flood. Wind-loading values shall be those required by this code.
5. Walls intended to break away under flood loads as specified in Item 3 or 4 have flood openings that meet the criteria in Section R322.2.2, Item 2.

**R322.3.5 Enclosed areas below design flood elevation.** Enclosed areas below the design flood elevation shall be used solely for parking of vehicles, building access or storage.

**R322.3.5.1 Protection of building envelope.** An exterior door that meets the requirements of Section R609 shall be installed at the top of stairs that provide access to the building and that are enclosed with walls designed to break away in accordance with Section R322.3.4.

**R322.3.6 Construction documents.** The construction documents shall include documentation that is prepared and sealed by a registered design professional that the design and methods of construction to be used meet the applicable criteria of this section.

**R322.3.7 Tanks.** Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood. Above-ground tanks shall be installed at or above the elevation required in Section R322.3.2. Where elevated on platforms, the platforms shall be cantilevered from or knee braced to the building or shall be supported on foundations that conform to the requirements of Section R322.3.

## SECTION R323 STORM SHELTERS

**R323.1 General.** This section applies to storm shelters where constructed as separate detached buildings or where constructed as safe rooms within buildings for the purpose of providing refuge from storms that produce high winds, such as tornados and hurricanes. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

## SECTION 324 SOLAR ENERGY SYSTEMS

**R324.1 General.** Solar energy systems shall comply with the provisions of this section.

**R324.2 Solar thermal systems.** Solar thermal systems shall be designed and installed in accordance with *the California Plumbing Code* and *the California Fire Code*.

**R324.3 Photovoltaic systems.** Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.6.1 and *the California Electrical Code*. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

**R324.3.1 Equipment listings.** Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703.

**R324.4 Rooftop-mounted photovoltaic systems.** Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

**R324.4.1 Roof live load.** Roof structures that provide support for photovoltaic panel systems shall be designed for applicable roof live load. The design of roof structures need not include roof live load in the areas covered by photovoltaic panel systems. Portions of roof structures not covered by photovoltaic panels shall be designed for roof live load. Roof structures that provide support for photovoltaic panel systems shall be designed for live load,  $L_r$ , for the load case where the photovoltaic panel system is not present.

**R324.5 Building-integrated photovoltaic systems.** Building-integrated photovoltaic systems that serve as roof coverings shall be designed and installed in accordance with Section R905.

**R324.5.1 Photovoltaic shingles.** Photovoltaic shingles shall comply with Section R905.16.

**R324.6 Roof access and pathways.** Roof access, pathways, and setback requirements shall be provided in accordance

with Sections R324.6.1 through R324.6.2.1. Access and minimum spacing shall be required to provide emergency access to the roof, to provide pathways to specific areas of the roof, to provide for smoke ventilation opportunity areas, and to provide emergency egress from the roof.

**Exceptions:**

1. Detached, nonhabitable structures, including but not limited to detached garages, parking shade structures, carports, solar trellises, and similar structures, shall not be required to provide roof access.
2. Roof access, pathways, and setbacks need not be provided where the fire code official has determined that rooftop operations will not be employed.
3. These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (2: 12) or less.

**R324.6.1 Pathways.** Not less than two minimum 36-inch-wide (914 mm) pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. At least one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a minimum 36-inch-wide (914 mm) pathway from the lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions such as vent pipes, conduit, or mechanical equipment.

**R324.6.2 Setback at ridge.** For photovoltaic arrays occupying not more than 33 percent of the plan view total roof area, not less than an 18-inch (457 mm) clear set back is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, not less than a 36-inch (914 mm) clear set back is required on both sides of a horizontal ridge.

**R324.6.2.1 Alternative setback at ridge.** Where an automatic sprinkler system is installed within the dwelling in accordance with NFPA 13D setbacks at ridges shall conform with one of the following:

1. For photovoltaic arrays occupying not more than 66 percent of the plan view total roof area, not less than an 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge.
2. For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, not less than a 36-inch (914 mm) clear setback is required on both sides of a horizontal ridge.

**R324.6.4 Emergency escape and rescue opening.** Panels and modules installed on dwellings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A 36-inch-wide (914 mm) pathway shall be provided to the emergency escape and rescue opening.

**R324.7 Ground-mounted photovoltaic systems.** Ground-mounted photovoltaic systems shall be designed and installed in accordance with Section R301.

**R324.7.1 Fire separation distances.** Ground-mounted photovoltaic systems shall be subject to the fire separation distance requirements determined by the enforcing agency.

**R324.7.2 Ground-mounted photovoltaic arrays.** Ground-mounted photovoltaic arrays shall comply with this section and the California Electrical Code. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of 10 feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.

**R324.7.3 Locations of DC conductors.** Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays. DC wiring shall be installed in metallic conduit or raceways when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.

## SECTION R325 MEZZANINES

**R325.1 General.** Mezzanines shall comply with Section R325.

**R325.2 Mezzanines.** The clear height above and below mezzanine floor construction shall be not less than 7 feet (2134 mm).

**R325.3 Area limitation.** The aggregate area of a mezzanine or mezzanines shall be not greater than one-third of the floor area of the room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located.

**R325.4 Means of egress.** The means of egress for mezzanines shall comply with the applicable provisions of Section R311.

**R325.5 Openness.** Mezzanines shall be open and unobstructed to the room in which they are located except for walls not more than 42 inches (1067 mm) in height, columns and posts.

**Exceptions:**

1. Mezzanines or portions thereof are not required to be open to the room in which they are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the mezzanine area.
2. In buildings that are not more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section R313, a mezzanine shall not be required to be open to the room in which the mezzanine is located.

## SECTION R326 SWIMMING POOLS, SPAS AND HOT TUBS

**R326.1 General.** The design and construction of pools and spas shall comply with the *International Swimming Pool and Spa Code*.

### SECTION R327 STATIONARY STORAGE BATTERY SYSTEMS

**R327.1 General.** Stationary storage battery systems, where provided, shall comply with the provisions of this section.

**R327.2 Equipment listings.** Stationary storage battery systems shall be listed and labeled for residential use in accordance with UL 9540.

**Exceptions:**

1. Where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached sheds located a minimum of 5 feet (1524 mm) from exterior walls, property lines, and public ways.
2. Battery systems that are an integral part of an electric vehicle are allowed provided, the installation complies with Section 625.48 of NFPA 70.
3. Battery systems less than 1 kWh (3.6 megajoules).

**R327.3 Installation.** Stationary storage battery systems shall be installed in accordance with the manufacturer's instructions and their listing, if applicable, and shall not be installed within the habitable space of a dwelling unit.

**R327.4 Electrical installation.** Stationary storage battery systems shall be installed in accordance with NFPA 70. Inverters shall be listed and labeled in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

**R327.5 Ventilation.** Indoor installations of stationary storage battery systems that include batteries that produce hydrogen or other flammable gases during charging shall be provided with ventilation in accordance with the California Mechanical Code.

**R327.6 Protection from impact.** Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers.

### SECTION R334 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

**R334.1 Construction waste management.** Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with the California Green Building Standards Code, Chapter 4, Division 4.4.

### SECTION R335 SPECIAL PROVISIONS FOR LICENSED 24-HOUR CARE FACILITIES IN A GROUP R-3.1

**R335.1 Scope.** The provisions of this section shall apply to 24-hour care facilities in a Group R-3.1 occupancy licensed by a governmental agency.

**R335.2 General.** The provisions in this section shall apply in addition to general requirements in this code.

**R335.2.1** Restraint shall not be practiced in a Group R-3.1 occupancy.

**Exception:** Occupancies which meet all the requirements for a Group I-3 occupancy.

**R335.2.2** Pursuant to Health and Safety Code Section 13133, regulations of the state fire marshal pertaining to

Occupancies classified as Residential Facilities (RF) and Residential-care Facilities for the Elderly (RCFE) shall apply uniformly throughout the state and no city, county, city and county, including a charter city or charter county, or fire protection district shall adopt or enforce any ordinance or local rule or regulation relating to fire and panic safety which is inconsistent with these regulations. A city, county, city and county, including a charter city or charter county may pursuant to Health and Safety Code Section 13143.5, or a fire protection district may pursuant to Health and Safety Code Section 13869.7, adopt standards more stringent than those adopted by the state fire marshal that are reasonably necessary to accommodate local climate, geological, or topographical conditions relating to roof coverings for Residential-care Facilities for the Elderly.

**Exception:** Local regulations relating to roof coverings in facilities licensed as a Residential Care Facility for the Elderly (RCFE) per Health and Safety Code Section 13133.

### R335.3 Building height and area provisions.

**R335.3.1 Limitations six or less clients.** Group R-3.1 occupancies where nonambulatory clients are housed above the first story, having more than two stories in height or having more than 3,000 square feet (279 m<sup>2</sup>) of floor area above the first story shall not be of less than one-hour fire-resistance-rated construction throughout.

In Group R-3.1 occupancies housing a bedridden client, the client sleeping room shall not be located above or below the first story.

**Exception:** Clients who become bedridden as a result of a temporary illness as defined in Health and Safety Code Sections 1566.45, 1568.0832 and 1569.72. A temporary illness is an illness which persists for 14 days or less. A bedridden client may be retained in excess of the 14 days upon approval by the Department of Social Services and may continue to be housed on any story in a Group R-3.1 occupancy classified as a licensed residential facility.

Every licensee admitting or retaining a bedridden resident shall, within 48 hours of the resident's admission or retention in the facility, notify the local fire authority with jurisdiction of the estimated length of time the resident will retain his or her bedridden status in the facility.

**R335.3.2.** Buildings housing protective social-care homes or in occupancies housing inmates who are not restrained need not be of one-hour fire-resistive construction when not more than two stories in height. In no case shall individual floor areas exceed 3,000 square feet (279 m<sup>2</sup>). The fire-resistive protection of the exterior walls shall not be less than one hour where such walls are located within 5 feet (1524 mm) of the property line. Openings within such walls are not permitted. Openings in exterior nonrated walls need not be protected.

### R335.4 Interior finish provisions.

**R335.4.1 Interior wall and ceiling finish.** Group R-3.1 occupancies housing a bedridden client shall comply with Interior Wall and Ceiling Finish requirements specified for Group I-2 occupancies in Table 803.11 of the California Building Code.

### R335.5 Fire protection system provisions.



**R335.5.1 Automatic sprinkler systems in Group R-3.1 occupancies.** An automatic sprinkler system shall be installed where required in Section R313.

**Exceptions:**

1. Existing Group R-3 occupancies converted to Group R-3.1 occupancies not housing bedridden clients, not housing nonambulatory clients above the first floor, and not housing clients above the second floor.
2. Existing Group R-3 occupancies converted to Group R-3.1 occupancies housing only one bedridden client and complying with Section R335.6.3.3.
3. Pursuant to Health and Safety Code Section 13113 existing occupancies housing ambulatory children only, none of whom are mentally ill children or children with intellectual disabilities, and the buildings or portions thereof in which such children are housed are not more than two stories in height, and buildings or portions thereof housing such children have an automatic fire alarm system activated by approved smoke detectors.
4. Pursuant to Health and Safety Code Section 13143.6 existing occupancies licensed for protective social care which house ambulatory clients only, none of whom is a child (under the age of 18 years), or who is elderly (65 years of age or over).

**R335.5.2 Smoke alarms in Groups R-3.1 occupancies.** Smoke alarms shall be installed where required in Section R314. In addition to the provisions set forth in Section R314 the following shall apply:

1. Smoke alarms shall be provided throughout the habitable areas of the dwelling unit except kitchens.
2. Facilities housing a bedridden client:
  - 2.1. Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source and shall be equipped with a battery backup.
  - 2.2. Smoke alarms shall be electrically interconnected so as to cause all smoke alarms to sound a distinctive alarm signal upon actuation of any single smoke alarm. Such alarm signal shall be audible throughout the facility at a minimal level of 15 db above ambient noise level. These devices need not be interconnected to any other fire alarm device, have a control panel, or be electrically supervised or provided with emergency power.

**R335.5.2.1 Audible alarm signal.** The audible signal shall be the standard fire alarm evacuation signal, ANSI S3.41 Audible Emergency Evacuation Signal, "three pulse temporal pattern," as described in NFPA 72.

**R335.5.2.2 Hearing impaired.** See Section 907.5.2.3 of the California Building Code.

**R335.5.2.3 Visible alarms.** Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.5 of the California Building Codes.

**Exceptions:**

1. Visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in enclosed exit stairways, exterior exit stairs, and exterior exit ramps.
3. Visible alarm notification appliances shall not be required in elevator cars.

**R335.5.2.4 Group R-3.1.** Protective social care facilities which house persons who are hearing impaired, shall be provided with notification appliances for the hearing impaired installed in accordance with NFPA 72 and which shall be activated upon initiation of the fire alarm system or the smoke alarms.

**Exception:** The use of the existing evacuation signaling scheme shall be permitted where approved by the enforcing agency.

**R335.6 Means of egress provisions.**

**R335.6.1 General.** In addition to the general means of egress requirements of Chapter 10 of the California Building Code, this section shall apply to Group R-3.1 occupancies.

**R335.6.2 Number of exits.**

**R335.6.2.1.** Group R-3.1 occupancies shall have a minimum of two exits.

**R335.6.3 Egress arrangements.**

**R335.6.3.1.** Egress through adjoining dwelling units shall not be permitted.

**R335.6.3.2 Group R-3.1 occupancies housing nonambulatory clients.** In a Group R-3.1 occupancy, bedrooms used by nonambulatory clients shall have access to at least one of the required exits which shall conform to one of the following:

1. Egress through a hallway or area into a bedroom in the immediate area which has an exit directly to the exterior and the corridor/hallway is constructed consistent with the dwelling unit interior walls. The hallway shall be separated from common areas by a solid wood door not less than 1<sup>3</sup>/<sub>8</sub> inch (35 mm) in thickness, maintained self-closing or shall be automatic closing by actuation of a smoke detector installed in accordance with Section 716.5.9 of the California Building Code.
2. Egress through a hallway which has an exit directly to the exterior. The hallway shall be separated from the rest of the house by a wall constructed consistent with the dwelling unit interior walls and opening protected by a solid wood door not less than 1<sup>3</sup>/<sub>8</sub> inch (35 mm) in thickness,

- b. A large family day-care home shall not be subject to the provisions of Division 13 (commencing with Section 21000) of the Public Resources Code.
- c. Use of a single-family dwelling for the purposes of a large family day-care home shall not constitute a change of occupancy for purposes of Part 1.5 (commencing with Section 17910) of Division 13 (State Housing Law), or for purposes of local building and fire codes.
- d. Large family day-care homes shall be considered as single-family residences for the purposes of the State Uniform Building Standards Code and local building and fire codes, except with respect to any additional standards specifically designed to promote the fire and life safety of the children in these homes adopted by the State Fire Marshal pursuant to this subdivision.

**R336.3 Smoke alarms.** Large family day-care homes shall be equipped with State Fire Marshal approved and listed single station residential type smoke alarms. The number and placement of smoke alarms shall be determined by the enforcement authority.

**R336.4 Fire extinguishers.** Large and small family day-care homes shall be equipped with a portable fire extinguisher having a minimum 2A10BC rating.

**R336.5 Fire alarm devices.** Every large family day-care home shall be provided with at least one manual device at a location approved by the authority having jurisdiction. Such device shall actuate a fire alarm signal, which shall be audible throughout the facility at a minimum level of 15 db above ambient noise level. These devices need not be interconnected to any other fire alarm device, have a control panel or be electrically supervised or provided with emergency power. Such device or devices shall be attached to the structure and may be of any type acceptable to the enforcing agent, provided that such devices are distinctive in tone and are audible throughout the structure.

**R336.6 Compliance.** Every large family day-care home shall comply with the provisions for Group R-3 occupancies and, if appropriate, Section R336.1. For the purposes of Section R336.1, the first story shall be designated as the floor used for residential occupancy nearest to the street level which provides primary access to the building.

Enforcement of the provisions shall be in accordance with the Health and Safety Code Sections 13145 and 13146. No city, county, city and county, or district shall adopt or enforce any building ordinance or local rule or regulation relating to the subject of fire and life safety in large-family day-care homes which is inconsistent with those standards adopted by the State Fire Marshal, except to the extent the building ordinance or local rule or regulation applies to single-family residences in which day care is not provided.

**R336.7 Special hazards.** Every unenclosed gas-fired water heater or furnace which is within the area used for child care

in a large family day-care home shall be protected in such a way as to prevent children from making contact with those appliances.

**Exception:** This does not apply to kitchen stoves or ovens.

**R336.8 Exiting.** Every story or basement of a large family day-care home shall be provided with two exits which are remotely located from each other. Every required exit shall be of a size to permit the installation of a door not less than 32 inches (813mm) in clear width and not less than 6 feet 8 inches (2032 mm) in height. A manually operated horizontal sliding door may be used as one of the two required exits.

Where basements are used for day-care purposes, one of the two required exits shall provide access directly to the exterior without entering the first story. The second exit from the basement may either pass through the story above or exit directly to the exterior.

Rooms used for day-care purposes shall not be located above the first story.

**Exception:** Buildings equipped with an automatic sprinkler system throughout and which have at least one of the required exits providing access directly to the exterior. NFPA 13R may be used in large family day-care homes. The sprinkler omissions of NFPA 13R shall not apply unless approved by the enforcing agency.

Exit doors, including manually operated horizontal sliding doors, shall be openable from the inside without use of a key or any special knowledge or effort.

## SECTION R337 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE

### SECTION R337.1 SCOPE, PURPOSE AND APPLICATION

**R337.1.1 Scope.** This chapter applies to building materials, systems and or assemblies used in the exterior design and construction of new buildings located within a Wildland-Urban Interface Fire Area as defined in Section R337.2A.

**R337.1.2 Purpose.** The purpose of this chapter is to establish minimum standards for the protection of life and property by increasing the ability of a building located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area to resist the intrusion of flame or burning embers projected by a vegetation fire and contributes to a systematic reduction in conflagration losses.

**R337.1.3 Application.** New buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing agency constructed

after the application date shall comply with the provisions of this chapter.

**Exceptions:**

1. Buildings of an accessory character classified as a Group U occupancy and not exceeding 120 square feet in floor area, when located at least 30 feet from an applicable building.
2. Buildings of an accessory character classified as Group U occupancy of any size located least 50 feet from an applicable building.
3. Buildings classified as a Group U Agricultural Building, as defined in Section 202 of this code (see also Appendix C – Group U Agricultural Buildings), when located at least 50 feet from an applicable building.
4. Additions to and remodels of buildings originally constructed prior to the applicable application date.

For the purposes of this section and Section R337.10, applicable building includes all buildings that have residential, commercial, educational, institutional, or similar occupancy type use.

**R337.1.3.1 Application date and where required.** New buildings for which an application for a building permit is submitted on or after July 1, 2008 located in any Fire Hazard Severity Zone or Wildland Interface Fire Area shall comply with all sections of this chapter, including all of the following areas:

1. All unincorporated lands designated by the State Board of Forestry and Fire Protection as State Responsibility Area (SRA) including:
  - 1.1. Moderate Fire Hazard Severity Zones
  - 1.2. High Fire Hazard Severity Zones
  - 1.3. Very-High Fire Hazard Severity Zones
2. Land designated as Very-High Fire Hazard Severity Zone by cities and other local agencies.
3. Land designated as Wildland Interface Fire Area by cities and other local agencies.

**Exceptions:**

1. New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter.
2. New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland Interface Fire Area designated by cities and other local agencies for which an application for a building permit is submitted on or after December 1, 2005 but prior to July 1, 2008, shall only comply with the following sections of this chapter:

2.1. Section R337.5 – Roofing

2.2. Section R337.6 – Vents

**R337.1.4 Inspection and certification.** Building permit applications and final completion approvals for buildings within the scope and application of this chapter shall comply with the following:

1. Building permit issuance. The local building official shall, prior to construction, provide the owner or applicant a certification that the building as proposed to be built complies with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this chapter. Issuance of a building permit by the local building official for the proposed building shall be considered as complying with this section.
2. Building permit final. The local building official shall, upon completion of construction, provide the owner or applicant with a copy of the final inspection report that demonstrates the building was constructed in compliance with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this chapter. Issuance of a certificate of occupancy by the local building official for the proposed building shall be considered as complying with this section.

**R337.1.5 Vegetation management compliance.** Prior to building permit final approval, the property shall be in compliance with the vegetation management requirements prescribed in California Fire Code Section 4906, including California Public Resources Code 4291 or California Government Code Section 51182. Acceptable methods of compliance inspection and documentation shall be determined by the enforcing agency and shall be permitted to include any of the following:

1. Local, state, or federal fire authority or designee authorized to enforce vegetation management requirements.
2. Enforcing agency.
3. Third party inspection and certification authorized to enforce vegetation management requirements.
4. Property owner certification authorized by the enforcing agency.

**R337.1.6 Application to accessory buildings and miscellaneous structures.** New accessory buildings and miscellaneous structures specified in Section R337.10 shall comply only with the requirements of that section.

**SECTION R337.2  
DEFINITIONS**

For the purposes of this chapter, certain terms are defined below:

**CDF DIRECTOR** means the Director of the California Department of Forestry and Fire Protection.



**EXTERIOR COVERING.** The exposed siding or cladding material applied to the exterior side of an exterior wall, roof eave soffit, floor projection or exposed underfloor framing.

**FIRE PROTECTION PLAN** is a document prepared for a specific project or development proposed for a Wildland-Urban Interface Fire Area. It describes ways to minimize and mitigate potential for loss from wildfire exposure. The fire protection plan shall be in accordance with this chapter and the California Fire Code, Chapter 49. When required by the enforcing agency for the purposes of granting modifications, a fire protection plan shall be submitted. Only locally adopted ordinances that have been filed with the California Building Standards Commission or the Department of Housing and Community Development in accordance with Section 1.1.8 shall apply.

**FIRE HAZARD SEVERITY ZONES** are geographical areas designated pursuant to California Public Resources Codes Sections 4201 through 4204 and classified as Very-High, High, or Moderate in State Responsibility Areas or as Local Agency Very-High Fire Hazard Severity Zones designated pursuant to California Government Code Sections 51175 through 51189. See California Fire Code Article 86.

The California Code of Regulations, Title 14, Section 1280 entitles the maps of these geographical areas as “Maps of the Fire Hazard Severity Zones in the State Responsibility Area of California.”

**HEAVY TIMBER.** A type of construction classification specified in Section R602. For use in this chapter, heavy timber shall be sawn lumber or glue laminated wood with the smallest minimum nominal dimension of 4 inches (102 mm). Heavy timber walls or floors shall be sawn or glue-laminated planks splined, tongue-and-grove, or set close together and well spiked.

**IGNITION-RESISTANT MATERIAL.** A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure of burning embers and small flames, as prescribed in Section R337.3 and SFM Standard 12-7A-5, Ignition-Resistant Material.

**LOCAL AGENCY VERY-HIGH FIRE HAZARD SEVERITY ZONE** means an area designated by a local agency upon the recommendation of the CDF Director pursuant to Government Code Sections 51177(c), 51178 and 5118 that is not a state responsibility area and where a local agency, city, county, city and county, or district is responsible for fire protection.

**LOG WALL CONSTRUCTION.** A type of construction in which exterior walls are constructed of solid wood members and where the smallest horizontal dimension of each solid wood member is at least 6 inches (152 mm).

**RAFTER TAIL.** The portion of roof rafter framing in a sloping roof assembly that projects beyond and overhangs an exterior wall.

**ROOF EAVE.** The lower portion of a sloping roof assembly that projects beyond and overhangs an exterior wall at the lower end of the rafter tails. Roof eaves may be either “open”

or “enclosed.” Open roof eaves have exposed rafter tails and an unenclosed space on the underside of the roof deck. Enclosed roof eaves have a boxed-in roof eave soffit with a horizontal underside or sloping rafter tails with an exterior covering applied to the underside of the rafter tails.

**ROOF EAVE SOFFIT.** An enclosed boxed-in soffit under a roof eave with exterior covering material applied to the soffit framing creating a horizontal surface on the exposed underside.

**STATE RESPONSIBILITY AREA** means lands that are classified by the Board of Forestry pursuant to Public Resources Code Section 4125 where the financial responsibility of preventing and suppressing forest fires is primarily the responsibility of the state.

**WILDFIRE** is any uncontrolled fire spreading through vegetative fuels that threatens to destroy life, property or resources as defined in Public Resources Code Sections 4103 and 4104.

**WILDFIRE EXPOSURE** is one or a combination of radiant heat, convective heat, direct flame contact and burning embers being projected by vegetation fire to a structure and its immediate environment.

**WILDLAND-URBAN INTERFACE FIRE AREA** is a geographical area identified by the state as a “Fire Hazard Severity Zone” in accordance with the Public Resources Code Sections 4201 through 4204 and Government Code Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires.

### SECTION R337.3 STANDARDS OF QUALITY

**R337.3.1 General.** Building material, systems, assemblies and methods of construction used in this chapter shall be in accordance with Section R337.3.

**R337.3.2 Qualification by testing.** Material and material assemblies tested in accordance with the requirements of Section R337.3 shall be accepted for use when the results and conditions of those tests are met. Product evaluation testing of material and material assemblies shall be approved or listed by the State Fire Marshal, or identified in a current report issued by an approved agency.

**R337.3.3 Approved agency.** Product evaluation testing shall be performed by an approved agency as defined in Section 1702 of the California Building Code. The scope of accreditation for the approved agency shall include building product compliance with code.

**R337.3.4 Labeling.** Material and material assemblies tested in accordance with the requirements of Section R337.3 shall bear an identification label showing the fire test results. That identification label shall be issued by a testing and/or inspecting agency approved by the State Fire Marshal.

1. Identification mark of the approved testing and/or inspecting agency.

2. Contact and identification information of the manufacturer.
3. Model number or identification of the product or material.
4. Pre-test weathering specified in this chapter.
5. Compliance standard as described under Section R337.3.7.

**R337.3.5 Weathering and surface treatment protection.**

**R337.3.5.1 General.** Material and material assemblies tested in accordance with the requirements of Section R337.3 shall maintain their fire test performance under conditions of use when installed in accordance with the manufacturers instructions.

**R337.3.5.2 Weathering.** Fire-retardant-treated wood and fire-retardant-treated wood shingles and shakes shall meet the fire test performance requirements of this chapter after being subjected to the weathering conditions contained in the following standards, as applicable to the materials and the conditions of use.

**R337.3.5.2.1 Fire-retardant-treated wood.** Fire-retardant-treated wood shall be tested in accordance with ASTM D2898 (Method A), and the requirements of Section 2303.2 of the California Building Code.

**R337.3.5.2.2 Fire-retardant-treated wood shingles and shakes.** Fire-retardant-treated wood shingles and shakes shall be approved and listed by the State Fire Marshal in accordance with Section 208(c), Title 19 California Code of Regulations.

**R337.3.5.3 Surface treatment protection.** The use of paints, coatings, stains, or other surface treatments are not an approved method of protection as required in this section.

**R337.3.6 Alternates for materials, design, tests and methods of construction.** The enforcing agency is permitted to modify the provisions of this chapter for site-specific conditions in accordance with Section 1.11.2.4. When required by the enforcing agency for the purposes of granting modifications, a fire protection plan shall be submitted in accordance with the California Fire Code, Chapter 49.

**R337.3.7 Standards of quality.** The State Fire Marshal standards for exterior wildfire exposure protection listed below and as referenced in this chapter are located in the California Referenced Standards Code, Part 12 and Chapter 44 of this code.

**SFM Standard 12-7A-1, Exterior Wall Siding and Sheathing.** A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 10 minutes duration.

**SFM Standard 12-7A-2, Exterior Windows.** A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for an 8-minute duration.

**SFM Standard 12-7A-3, Horizontal Projection Under-side A** fire resistance test standard consisting of a 300

kW intensity direct flame exposure for a 10 minute duration.

**SFM Standard 12-7A-4, Decking.** A two-part test consisting of a heat release rate (Part A) deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3 minute duration, and a (Part B) sustained deck assembly combustion test consisting of a deck upper surface burning ember exposure with a 12 mph wind for 40 minutes using a 2.2 lb (1 kg) burning "Class A" size 12" x 12" x 2.25" (300 mm x 300 mm x 57 mm) roof test brand.

**SFM Standard 12-7A-4A, Decking Alternate Method A.** A heat release rate deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3 minute duration.

**SFM Standard 12-7A-5, Ignition-Resistant Material.** A generic building material surface burning flame spread test standard consisting of an extended 30 minute ASTM E84 or UL 723 test method as is used for Fire-Retardant-Treated wood.

ASTM D2898, Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing

ASTM D3909/D3909M, Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules

ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM E2632/E2632M, Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials

ASTM E2707, Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

ASTM E2726/E2726M, Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands

ASTM E2886/E2886M, Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

ASTM E2957, Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections

NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies

UL 723, Standard for Test for Surface Burning Characteristics of Building Materials

**SECTION R337.4  
IGNITION-RESISTANT CONSTRUCTION**

**R337.4.1 General.** The materials prescribed herein for ignition resistance shall conform to the requirements of this chapter.

**R337.4.2 Ignition-resistant materials.** Ignition-resistant materials shall comply with one of the following:

1. The requirements in Section R337.4.3 when tested in accordance with the test procedures set forth in ASTM E84 or UL 723,
2. The test procedures and requirements set forth in SFM Standard 12-7A-5 "Ignition-Resistant Material", or
3. One of the alternative methods in Section R337.4.4.

**R337.4.3 Conditions of acceptance for ignition-resistant material tested in accordance with ASTM E84 or UL 723.** A material shall comply with the conditions of acceptance in 1 and 2 below when the test is continued for an additional 20-minute period, meaning for a total test period of an "extended" 30-minute test period.

1. The material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30-minute test period.
2. The material shall exhibit a flame front that does not progress more than 10<sup>1</sup>/<sub>2</sub> feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test period.

**R337.4.4 Alternative methods for determining ignition-resistant material.** Any one of the following shall be accepted as meeting the definition of ignition-resistant material:

1. Noncombustible material. Material that complies with the definition for noncombustible materials in Section 202.
2. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use that complies with the requirements of Section 2303.2 of the California Building Code.
3. Fire-retardant-treated wood shingles and shakes. Fire-retardant-treated wood shingles and shakes, as defined in Section 1505.6 of the California Building Code and listed by State Fire Marshal for use as "Class B" roof covering, shall be accepted as an ignition-resistant wall covering material when installed over solid sheathing.

### SECTION R337.5 ROOFING

**R337.5.1 General.** Roofs shall comply with the requirements of Sections R337 and R902. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions.

**R337.5.2 Roof coverings.** Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to resist the intrusion of flames and embers, be firestopped with approved materials or have one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking.

**R337.5.3 Roof valleys.** Where valley flashing is installed, the flashing shall be not less than 0.019-inch (0.48 mm) No. 26 gage galvanized sheet corrosion-resistant metal installed over not less than one layer of minimum 72-pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909, at least 36-inch-wide (914 mm) running the full length of the valley.

**R337.5.4 Roof gutters.** Roof gutters shall be provided with the means to prevent the accumulation of leaves and debris in the gutter.

### SECTION R337.6 VENTS

**R337.6.1 General.** Where provided, ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation shall be in accordance with Section 1203 of the California Building Code and Sections R337.6.1 through R337.6.3 of this section to resist building ignition from the intrusion of burning embers and flame through the ventilation opening.

**R337.6.2 Requirements.** Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials, or other devices that meet one of the following requirements:

1. Vents shall be listed to ASTM E2886 and comply with all of the following:
  - 1.1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
  - 1.2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
  - 1.3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).
2. Vents shall comply with all of the following:
  - 2.1. The dimensions of the openings therein shall be a minimum of <sup>1</sup>/<sub>16</sub> inch (1.6 mm) and shall not exceed <sup>1</sup>/<sub>8</sub> inch (3.2 mm).
  - 2.2. The materials used shall be noncombustible.

**Exception:** Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible wire mesh, may be of combustible materials.

- 2.3. The materials used shall be corrosion resistant.

**R337.6.3 Ventilation openings on the underside of eaves and cornices.** Vents shall not be installed on the underside of eaves and cornices.

**Exceptions:**

1. Vents listed to ASTM E2886 and complying with all of the following:

- 1.1. *There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.*
- 1.2. *There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.*
- 1.3. *The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).*
2. *The enforcing agency shall be permitted to accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.*
3. *Vents complying with the requirements of Section R337.6.2 shall be permitted to be installed on the underside of eaves and cornices in accordance with either one of the following conditions:*
  - 3.1. *The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 of the California Building Code or,*
  - 3.2. *The exterior wall covering and exposed underside of the eave are of noncombustible material, or ignition-resistant materials, as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material the requirements of Section R337.4.3, and the vent is located more than 12 feet (3.66 m) from the ground or walking surface of a deck, porch, patio, or similar surface.*

**SECTION R337.7  
EXTERIOR COVERING**

**R337.7.1 Scope.** *The provisions of this section shall govern the materials and construction methods used to resist building ignition and/or safeguard against the intrusion of flames resulting from small ember and short-term direct flame contact exposure.*

**R337.7.2 General.** *The following exterior covering materials and/or assemblies shall comply with this section:*

1. *Exterior wall covering material.*
2. *Exterior wall assembly.*
3. *Exterior exposed underside of roof eave overhangs.*
4. *Exterior exposed underside of roof eave soffits.*
5. *Exposed underside of exterior porch ceilings.*
6. *Exterior exposed underside of floor projections.*
7. *Exterior underfloor areas.*

**Exceptions:**

1. *Exterior wall architectural trim, embellishments, fascias and gutters.*

2. *Roof or wall top cornice projections and similar assemblies.*
3. *Roof assembly projections over gable end walls.*
4. *Solid wood rafter tails and solid wood blocking installed between rafters having minimum dimension 2 inch (50.8 mm) nominal.*
5. *Deck walking surfaces shall comply with Section R337.9 only.*

**R337.7.3 Exterior walls.** *The exterior wall covering or wall assembly shall comply with one of the following requirements:*

1. *Noncombustible material.*
2. *Ignition-resistant material.*
3. *Heavy timber exterior wall assembly.*
4. *Log wall construction assembly.*
5. *Wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section R337.7.3.1.*
6. *Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-1.*

**Exception:** *Any of the following shall be deemed to meet the assembly performance criteria and intent of this section:*

1. *One layer of 5/8-inch Type X gypsum sheathing applied behind the exterior covering or cladding on the exterior side of the framing.*
2. *The exterior portion of a 1-hour fire resistive exterior wall assembly designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.*

**R337.7.3.1 Conditions of acceptance when tested in accordance with ASTM E2707.** *The ASTM E2707 test shall be conducted on a minimum of three test specimens and the conditions of acceptance in 1 and 2 below shall be met. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.*

1. *Absence of flame penetration through the wall assembly at any time.*
2. *Absence of evidence of glowing combustion on the interior surface of the assembly at the end of the 70-minute test.*

**R337.7.3.2 Extent of exterior wall covering.** *Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2 inch (50.8 mm) nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.*

**R337.7.4 Open roof eaves.** The exposed roof deck on the underside of unenclosed roof eaves shall consist of one of the following:

1. Noncombustible material.
2. Ignition-resistant material.
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside exterior of the roof deck.
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the roof deck designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.

**Exceptions:** The following materials do not require protection:

1. Solid wood rafter tails on the exposed underside of open roof eaves having a minimum nominal dimension of 2 inch (50.8 mm).
2. Solid wood blocking installed between rafter tails on the exposed underside of open roof eaves having a minimum nominal dimension of 2 inch (50.8 mm).
3. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails.
4. Fascia and other architectural trim boards.

**R337.7.5 Enclosed roof eaves and roof eave soffits.** The exposed underside of enclosed roof eaves having either a boxed-in roof eave soffit with a horizontal underside, or sloping rafter tails with an exterior covering applied to the underside of the rafter tails, shall be protected by one of the following:

1. Noncombustible material.
2. Ignition-resistant material.
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the rafter tails or soffit.
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the rafter tails or soffit including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
5. Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in Section R337.7.10 when tested in accordance with the test procedures set forth in ASTM E2957.
6. Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.

**Exceptions:** The following materials do not require protection:

1. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails.
2. Fascia and other architectural trim boards.

**R337.7.6 Exterior porch ceilings.** The exposed underside of exterior porch ceilings shall be protected by one of the following:

1. Noncombustible material.
2. Ignition-resistant material.
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind the exterior covering on the underside of the ceiling.
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the ceiling assembly including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
5. Porch ceiling assemblies with a horizontal underside that meet the performance criteria in Section R337.7.10 when tested in accordance with the test procedures set forth in ASTM E2957.
6. Porch ceiling assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.

**Exception:** Architectural trim boards.

**R337.7.7 Floor projections.** The exposed underside of a cantilevered floor projection where a floor assembly extends over an exterior wall shall be protected by one of the following:

1. Noncombustible material.
2. Ignition-resistant material.
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection.
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor projection including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
5. The underside of a floor projection assembly that meet the performance criteria in Section R337.7.10 when tested in accordance with the test procedures set forth in ASTM E2957.
6. The underside of a floor projection assembly that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.

**Exception:** Architectural trim boards.

**R337.7.8 Underfloor protection.** The underfloor area of elevated or overhanging buildings shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall consist of one of the following:

1. Noncombustible material.



2. Ignition-resistant material.
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection.
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
5. The underside of a floor assembly that meets the performance criteria in Section R337.7.10 when tested in accordance with the test procedures set forth in ASTM E2957.
6. The underside of a floor assembly that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3.

**Exception:** Heavy-timber structural columns and beams do not require protection.

**R337.7.9 Underside of appendages.** When required by the enforcing agency the underside of overhanging appendages shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall consist of one of the following:

1. Noncombustible material.
2. Ignition-resistant material.
3. One layer of  $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection.
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
5. The underside of a floor assembly that meets the performance criteria in accordance with the test procedures set forth in either of the following:
  - 5.1. SFM Standard 12-7A-3; or
  - 5.2. ASTM E2957

**Exception:** Heavy-timber structural columns and beams do not require protection.

**R337.7.10 Conditions of acceptance when tested in accordance with ASTM E2957.** The test shall be conducted on a minimum of three test specimens and the conditions of acceptance in 1 through 3 below shall be met. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

1. Absence of flame penetration of the eaves or horizontal projection assembly at any time.
2. Absence of structural failure of the eaves or horizontal projection subassembly at any time.
3. Absence of sustained combustion of any kind at the conclusion of the 40-minute test.

## SECTION R337.8

### EXTERIOR WINDOWS, SKYLIGHTS AND DOORS

#### R337.8.1 General.

**R337.8.2 Exterior glazing.** The following exterior glazing materials and/or assemblies shall comply with this section:

1. Exterior windows.
2. Exterior glazed doors.
3. Glazed openings within exterior doors.
4. Glazed openings within exterior garage doors.
5. Exterior structural glass veneer.
6. Skylights.
7. Vents.

**R337.8.2.1 Exterior windows, skylights and exterior glazed door assembly requirements.** Exterior windows, skylights and exterior glazed door assemblies shall comply with one of the following requirements:

1. Be constructed of multipane glazing with a minimum of one tempered pane meeting the requirements of Section R308 Safety Glazing, or
2. Be constructed of glass block units, or
3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or
4. Be tested to meet the performance requirements of SFM Standard 12-7A-2.

**R337.8.2.2 Structural glass veneer.** The wall assembly behind structural glass veneer shall comply with Section R337.7.3.

**R337.8.3 Exterior doors.** Exterior doors shall comply with one of the following:

1. The exterior surface or cladding shall be of noncombustible material, or
2. The exterior surface or cladding shall be of ignition-resistant material, or
3. The exterior door shall be constructed of solid core wood that complies with the following requirements:
  - 3.1. Stiles and rails shall not be less than  $1\frac{3}{8}$  inches thick
  - 3.2. Panels shall not be less than  $1\frac{1}{4}$  inches thick, except for the exterior perimeter of the panel that shall be permitted to taper to a tongue not less than  $\frac{3}{8}$  inch thick.
4. The exterior door assembly shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.
5. The exterior surface or cladding shall be tested to meet the performance requirements of Section R337.7.3.1 when tested in accordance with ASTM E2707.
6. The exterior surface or cladding shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

**R337.8.3.1 Exterior door glazing.** Glazing in exterior doors shall comply with Section R337.8.2.1.

**R337.8.4 Weather stripping.** Exterior garage doors shall be provided with weather stripping to resist the intrusion of embers from entering through gaps between doors and door openings when visible gaps exceed  $1/8$ -inch (3.2 mm). Weather stripping or seals shall be installed on the bottom, sides, and tops of doors to reduce gaps between doors and door openings to  $1/8$ -inch (3.2 mm) or less.

## SECTION R337.9 DECKING

**R337.9.1 General.** The walking surface material of decks, porches, balconies and stairs shall comply with the requirements of this section.

**R337.9.2 Where required.** The walking surface material of decks, porches, balconies and stairs shall comply with the requirements of this section when any portion of such surface is within 10 feet (3048 mm) of the building.

**R337.9.3 Decking surfaces.** The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. Material that complies with the performance requirements of Section R337.9.4 when tested in accordance with both ASTM E2632 and ASTM E2726.
2. Ignition-resistant material that complies with the performance requirements of Section R337.4.3 when tested in accordance with ASTM E84 or UL 723.
3. Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.
4. Exterior fire retardant treated wood.
5. Noncombustible material.
6. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also composed of noncombustible or ignition-resistant material.

**Exception:** Wall material may be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM E84 with a Class B flame spread rating.

7. Any material that complies with the performance requirements of Section R337.9.5 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also composed of only noncombustible or ignition-resistant materials.

**Exception:** Wall material shall be permitted to be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM E84 with a Class B flame spread index.

**R337.9.4 Requirements for type of ignition-resistant material in Section R337.9.3, Item 1.** The material shall

be tested in accordance with both ASTM E2632 and ASTM E2726 and shall comply with the conditions of acceptance in Sections R337.9.4.1 and R337.9.4.2. The material shall also be tested in accordance with ASTM E84 or UL 723 and comply with the performance requirements of Section R337.4.3.

**R337.9.4.1 Conditions of acceptance for ASTM E2632.** The ASTM E2632 test shall be conducted on a minimum of three test specimens and the conditions of acceptance in Items 1 through 3 below shall be met. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

1. Peak heat release rate of less than or equal to 25 kW/ft<sup>2</sup> (269 kW/m<sup>2</sup>).
2. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-minute observation period.
3. Absence of falling particles that are still burning when reaching the burner or floor.

**R337.9.4.2 Conditions of acceptance for ASTM E2726.** The ASTM E2726 test shall be conducted on a minimum of three test specimens and the conditions of acceptance in Items 1 and 2 below shall be met. If any one of the three test specimens does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

1. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-minute observation period.
2. Absence of falling particles that are still burning when reaching the burner or floor.

**R337.9.5 Requirements for type of ignition-resistant material in Section R337.9.3, Item 6.** The material shall be tested in accordance with ASTM E2632 and shall comply with the following condition of acceptance. The ASTM E2632 test shall be conducted on a minimum of three test specimens and the peak heat release rate shall be less than or equal to 25 kW/ft<sup>2</sup> (269 kW/m<sup>2</sup>). If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the condition of acceptance.

## SECTION R337.10 ACCESSORY STRUCTURES

**R337.10.1 General.** Accessory buildings and miscellaneous structures defined in this section that have the potential to pose a significant exterior fire exposure hazard to applicable buildings during wildfires shall be constructed to conform to the requirements of this section.

**R337.10.2 Applicability.** The provisions of this section shall apply to the buildings covered by Section R337.1.3 Exception 1. This section shall also apply to specified attached and detached miscellaneous structures that

require a building permit, including but not limited to; trellises, arbors, patio covers, carports, gazebos, and similar structures.

**Exceptions:**

1. Decks shall comply with the requirements of Section R337.9.
2. Awnings and canopies shall comply with the requirements of Section 3105 of the California Building Code.
3. Exterior wall architectural trim, embellishments, and fascias.
4. Roof- or wall-top cornice projections and similar assemblies.

**R337.10.3 Where required.** No requirements shall apply to accessory buildings or miscellaneous structures when located at least 50 feet from an applicable building. Applicable accessory buildings and attached miscellaneous structures, or detached miscellaneous structures that are installed at a distance of less than 3 feet from an applicable building, shall comply with this section. When required by the enforcing agency, detached miscellaneous structures that are installed at a distance of more than 3 feet but less than 50 feet from an applicable building shall comply with the requirements of this section.

**R337.10.3.1 Accessory building requirements.** Applicable accessory buildings that are less than 120 square feet in floor area and are located more than 30 feet but less than 50 feet from an applicable building shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section R337.4.2.

**R337.10.3.2 Attached miscellaneous structure requirements.** Applicable miscellaneous structures that are attached to, or installed at a distance of less than 3 feet from, an applicable building shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section R337.4.2.

**R337.10.3.3 Detached miscellaneous structure requirements.** When required by the enforcing agency, applicable detached miscellaneous structures that are installed at a distance of more than 3 feet but less than 50 feet from an applicable building shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section R337.4.3.

### SECTION R338 ELECTRIC VEHICLE

**R338.1 Electric vehicle.** An automotive-type vehicle for highway use, such as passenger automobiles, buses, trucks, vans and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array or other source of electric current. For the purpose of this chapter, electric motorcycles and similar type vehicles and off-road self-propelled electric vehicles such as industrial trucks, hoists, lifts, transports, golf carts, airline

ground support equipment, tractors, boats and the like, are not included.

**R338.2 Charging.** In any building or interior area used for charging electric vehicles, electrical equipment shall be installed in accordance with the California Electrical Code.

**R338.3 Ventilation.** Mechanical exhaust ventilation, when required by the California Electrical Code shall be provided at a rate as required by Article 625 or as required by Section 1203 of the California Building Code whichever is greater. The ventilation system shall include both the supply and exhaust equipment and shall be permanently installed and located to intake supply air from the outdoors, and vent the exhaust directly to, the outdoors without conducting the exhaust air through other spaces within the building.

**Exception:** Positive pressure ventilation systems shall only be allowed in buildings or areas that have been designed and approved for that application.

**R338.4 Electrical interface.** The electrical supply circuit to electrically powered mechanical ventilation equipment shall be interlocked with the recharging equipment used to supply the vehicle(s) being charged, and shall remain energized during the entire charging cycle. Electric vehicle recharging equipment shall be marked or labeled in accordance with the California Electrical Code.

**Exceptions:**

1. Exhaust ventilation shall not be required in areas with an approved engineered ventilation system, which maintains a hydrogen gas concentration at less than 25 percent of the lower flammability limit.
2. Mechanical exhaust ventilation for hydrogen shall not be required where the charging equipment utilized is installed and listed for indoor charging of electric vehicles without ventilation.

### SECTION R340 POLLUTANT CONTROL

**R340.1 Finish material pollutant control.** Finish materials including adhesives, sealants, caulks, paints and coatings, aerosol paints and coatings, carpet systems, carpet cushion, carpet adhesive, resilient flooring systems and composite wood products shall meet the volatile organic compound (VOC) emission limits in accordance with the California Green Building Standards Code, Chapter 4, Division 4.5.

ASTM—continued

D4897/D4897M—01 (2009)	Specification for Asphalt Coated Glass-fiber Venting Base Sheet Used in Roofing . . . . .	Table R905.9.2
D4990—97a (2005)e01	Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing . . . . .	Table R905.9.2
D5019—07a	Specification for Reinforced Nonvulcanized Polymeric Sheet Used in Roofing Membrane . . . . .	R905.12.2
D5055—2013	Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-joists . . . . .	R502.1.2
D5456—2013	Standard Specification for Evaluation of Structural Composite Lumber Products . . . . .	R502.1.5, R602.1.5, R802.1.7
D5516—09	Test Method for Evaluating the Flexural Properties of Fire-retardant-treated Softwood Plywood Exposed to the Elevated Temperatures . . . . .	R802.1.5.7
D5643/D5643M—06 (2012)e1	Specification for Coal Tar Roof Cement Asbestos-free . . . . .	Table R905.9.2
D5664—10	Test Methods For Evaluating the Effects of Fire-retardant Treatments and Elevated Temperatures on Strength Properties of Fire-retardant-treated Lumber . . . . .	R802.1.5.7
D5665—99a (2006)	Specification for Thermoplastic Fabrics Used in Cold-applied Roofing and Waterproofing . . . . .	Table R905.9.2
D5726—98 (2005)	Specification for Thermoplastic Fabrics Used in Hot-applied Roofing and Waterproofing . . . . .	Table R905.9.2
D6083—05e01	Specification for Liquid-applied Acrylic Coating Used in Roofing . . . . .	Table R905.9.2, Table R905.11.2, Table R905.14.3, R905.15.2
D6162—2000a (2008)	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements . . . . .	Table R905.11.2
D6163—00 (2008)	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements . . . . .	Table R905.11.2
D6164/D6164M—11	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements . . . . .	Table R905.11.2
D6222/D6222M—11	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements . . . . .	Table R905.11.2
D6223/D6223M—02 (2011)e1	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcement . . . . .	Table R905.11.2
D6298—05e1	Specification for Fiberglass-reinforced Styrene Butadiene Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface . . . . .	Table R905.11.2
D6305—08	Practice for Calculating Bending Strength Design Adjustment Factors for Fire-retardant-treated Plywood Roof Sheathing . . . . .	R802.1.5.6
D6380—03 (2009)	Standard Specification for Asphalt Roll Roofing (Organic Felt) . . . . .	Table R905.1.1(1), R905.2.8.2, R905.5.4
D6694—08	Standard Specification for Liquid-applied Silicone Coating Used in Spray Polyurethane Foam Roofing Systems . . . . .	Table R905.14.3, R905.15.2
D6754/D6745M—10	Standard Specification for Ketone-ethylene-ester-based Sheet Roofing . . . . .	R905.13.2
D6757—2013	Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products . . . . .	Table R905.1.1(1), R905.1.1, R905.16.3, R905.16.4.2
D6841—08	Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-retardant-treated Lumber . . . . .	R802.1.5.7
D6878/D6878—11a	Standard Specification for Thermoplastic-polyolefin-based Sheet Roofing . . . . .	R905.13.2
D6947—07	Standard Specification for Liquid Applied Moisture Cured Polyurethane Coating Used in Spray Polyurethane Foam Roofing System . . . . .	Table R905.14.3, R905.15.2
D7032—10a	Standard Specification for Establishing Performance Ratings for Wood-plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails) . . . . .	R507.3, R507.3.1, 507.3.4, 507.3.4
D7158—D7158M—2011	Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method) . . . . .	R905.2.4.1, Table R905.2.4.1
D7254—07	Standard Specification for Polypropylene (PP) siding . . . . .	Table R703.3(1), R703.14
D7425/D7425M—11	Standard Specification for Spray Polyurethane Foam Used for Roofing Application . . . . .	R905.14.2
D7672—2012	Standard Specification for Evaluating Structural Capacities of Rim Board Products and Assemblies . . . . .	R502.1.7, R602.1.7, R802.1.7
D7793—13	Standard Specification for Insulated Vinyl Siding . . . . .	R703.13, Table R703.3(1)
E84—2016	Standard Test Method for Surface Burning Characteristics of Building Materials . . . . .	R202, R302.9.3, R302.9.4, R302.10.1, R302.10.2, R316.3, R316.5.9, R316.5.11, R337.9.3, R507.3.2, R802.1.5, M1601.3, M1601.5.2
E96/E96M—2013	Test Method for Water Vapor Transmission of Materials . . . . .	R202, Table R610.3.1, M1411.6 M1601.4.6
E108—2011	Test Methods for Fire Tests of Roof Coverings . . . . .	R302.2.2, R902.1
E119—2012a	Test Methods for Fire Tests of Building Construction and Materials . . . . .	Table R302.1(1), Table R302.1(2), R302.2, R302.2.2, R302.3, R302.4.1, R302.11.1
E136—2012	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C . . . . .	R202, R302.11
E283—04	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen . . . . .	N1102.4.5
E330—02	Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference . . . . .	R609.4, R609.5, R612.4, R703.1.2

REFERENCED STANDARDS

ASTM—continued

E331—00 (2009)	Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference . . . . .	R703.1.1
E779—10	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization . . . . .	N1102.4.1.2
E814—2013	Test Method for Fire Tests of Through-penetration Firestops . . . . .	R302.4.1.2
E970—2010	Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source . . . . .	R302.10.5
E1509—12	Standard Specification for Room Heaters, Pellet Fuel-burning Type . . . . .	M1410.1
E1602—03 (2010)e1	Guide for Construction of Solid Fuel Burning Masonry Heaters . . . . .	R1002.2
E1827—11	Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door . . . . .	N1102.4.1.2
E1886—05	Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials . . . . .	R301.2.1.2, R609.6.1
E1996—2012a	Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes . . . . .	R301.2.1.2, R301.2.1.2.1, R609.6.1
E2178—2013	Standard Test Method for Air Permeance of Building Materials . . . . .	R202
E2231—09	Standard Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics . . . . .	M1601.3
E2273—03 (2011)	Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies . . . . .	R703.9.2
E2568—09e1	Standard Specification for PB Exterior Insulation and Finish Systems . . . . .	R703.9.1, R703.9.2
E2570—07	Standard Test Methods for Evaluating Water-resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage . . . . .	R703.9.2
E2632/E2632M—2013e1	Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials . . . . .	R337.9.3, R337.9.4, R337.9.4.1, R337.9.5
E2634—11	Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems . . . . .	R404.1.3.3.6.1, R608.4.4
E2707—2015	Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure . . . . .	R337.7.3, R337.7.3.1, R337.8.3
E2726/E2726M—2012a	Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands . . . . .	R337.9.3, R337.9.4, R337.9.4.2
E2886/E2886M—2014	Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingent . . . . .	R337.6.2, R337.6.3
	<b>*ASTM E2886, Amended Sections as follows:</b>	
	<b>Revise Sections 10.1.8.3, 10.1.8.4, and 10.1.8.5 as follows:</b>	
	<b>10.1.8.3</b> Report the temperatures of the unexposed temperatures on the unexposed side of the vent during the entire optional Insulation Test of the Flame Intrusion.	
	<b>10.1.8.4</b> The maximum temperature reached during the test by any one of the unexposed surface thermocouples during the entire optional Insulation Test of the Flame Intrusion Test.	
	<b>10.1.8.5</b> The maximum average temperature reached during the test by all of the unexposed surface thermocouples during the entire optional Insulation Test of the Flame Intrusion Test.	
E2957—2015	Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections . . . . .	R337.7.5, R337.7.6, R337.7.8, R337.7.10
	<b>*ASTM E2957, Amended Sections as follows:</b>	
	<b>Add new Section 12.5 as follows:</b>	
	<b>12.5 Conditions of Acceptance:</b> <i>Should one of the three replicates fail to meet the Conditions of Acceptance, three additional tests may be run. All of the additional tests must meet the Conditions of Acceptance.</i>	
	1. <i>Absence of flame penetration of the eaves or horizontal projection assembly at any time.</i>	
	2. <i>Absence of structural failure of the eaves or horizontal projection subassembly at any time.</i>	
	3. <i>Absence of sustained combustion of any kind at the conclusion of the 40-minute test.</i>	
F405—05	Specification for Corrugated Polyethylene (PE) Pipe and Fittings . . . . .	Table P3009.11, Table P3302.1, Table AG101.1
F409—12	Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings . . . . .	Table P2701.1, P2702.2, P2702.3
F437—09	Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80 . . . . .	Table P2906.6
F438—09	Specification for Socket-type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40 . . . . .	Table P2906.6
F439—12	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80 . . . . .	Table P2906.6
F441/F441M—13	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80 . . . . .	Table P2906.4, Table P2906.5, Table AG101.1
F442/F442M—13	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR) . . . . .	Table P2906.4, Table P2906.5, Table AG101.1
F477—10	Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe . . . . .	P2906.17, P3003.13
F493—10	Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings . . . . .	P2906.9.1.2, P2906.9.1.3





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Standard reference number	Title	Referenced in code section number
13—16	Installation of Sprinkler Systems <i>as amended*</i> ..... R302.3 <i>See CCR, Title 24 Part 2 California Building Code, Chapter 35 or CCR, Title 24, Part 9 California Fire Code, Chapter 80 for amendments to NFPA 13.</i>	
13D—16	Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes <i>as amended*</i> ..... R313.1.1, R313.2.1, R313.3.1, R313.3.2, R313.3.2.3.1, R313.3.2.4.2, R313.3.6.1	
*NFPA 13D, Amended Sections as follows:		
<b>Revise Section 6.2.2 to read as follows:</b>		
6.2.2 Where a well, pump, tank or combination thereof is the source of supply for a fire sprinkler system, the configuration for the system shall be one of the following:		
(1) The water supply shall serve both domestic and fire sprinkler systems,		
(a) A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system. The connection shall return water to the tank.		
(b) Any disconnecting means for the pump shall be approved.		
(c) A method for refilling the tank shall be piped to the tank.		
(d) A method of seeing the water level in the tank shall be provided without having to open the tank.		
(e) The pump shall not be permitted to sit directly on the floor.		
(2) A stand-alone tank is permitted if the following conditions are met:		
(a) The pump shall be connected to a 220-volt circuit breaker shared with a common household appliance (e.g., range, oven, dryer),		
(b) The pump shall be a stainless steel 240-volt pump,		
(c) A valve shall be provided to exercise the pump. The discharge of the exercise valve shall drain to the tank, and		
(d) A sign shall be provided stating “Valve must be opened monthly for 5 minutes.”		
(e) A means for automatically refilling the tank level, so that the tank capacity will meet the required water supply duration in minutes, shall be provided.		
(f) A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system. The connection may return water to the tank.		
(g) Any disconnecting means for the pump shall be approved.		
(h) A method for refilling the tank shall be piped to the tank.		
(i) A method of seeing the water level in the tank shall be provided without having to open the tank.		
(j) The pump shall not be permitted to sit directly on the floor.		
<b>Add new Section 6.2.2.1 to read as follows:</b>		
6.2.2.1 Where a fire sprinkler system is supplied by a stored water source with an automatically operated means of pressurizing the system other than an electric pump, the water supply may serve the sprinkler system only.		
<b>Add new Section 6.2.4 to read as follows:</b>		
6.2.4 Where a water supply serves both domestic and fire sprinkler systems, 5 gpm (19 L/min) shall be added to the sprinkler system demand at the point where the systems are connected, to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler. For multipurpose piping systems, the 5 gpm (19 L/min) demand shall be added at the domestic connection nearest the design area. This demand may be split between two domestic connections at 2.5 gpm (10 L/min) each.		
<b>Revise Section 8.3.4 to read as follows:</b>		
8.3.4* Sprinklers shall not be required in detached garages, open attached porches, carports with no habitable space above, and similar structures.		
<b>Revise Section 8.3.4 to read as follows:</b>		
8.3.4* Sprinklers shall not be required in detached garages, open attached porches, carports with no habitable space above, and similar structures.		
<b>Add new Section 8.3.10 and 8.3.10.1 as follows:</b>		
8.3.10 Solar photovoltaic panel structures		
8.3.10.1 Sprinklers shall be permitted to be omitted from the following structures:		
(1) Solar photovoltaic panel structures with no use underneath. Signs may be provided, as determined by the enforcing agency prohibiting any use underneath including storage.		
(2) Solar photovoltaic (PV) panels supported by framing that have sufficient uniformly distributed and unobstructed openings throughout the top of the array (horizontal plane) to allow heat and gases to escape, as determined by the enforcing agency.		
13R—16	See CCR, Title 24 Part 2 California Building Code, Chapter 35 or CCR, Title 24, Part 9 California Fire Code, Chapter 80 for amendments to NFPA 13.	
31—11	Standard for the Installation of Oil-burning Equipment. .... M1701.1, M1801.3.1, M1805.3	
58—14	Liquefied Petroleum Gas Code ..... G2412.2, G2414.6.2	

NFPA—continued

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72—16

National Electrical Code . . . . . E3401.1, E3401.2, E4301.1, Table E4303.2, E4304.3, E4304.4, R324.3  
National Fire Alarm and Signaling Code as amended\* . . . . . R314.1, R314.2, R314.3.4, R325.5.2.1, R235.5.2.4  
\*NFPA 72, Amended Sections as follows:

**Revise Section 10.3.1 to read as follows:**

**10.3.1** Equipment constructed and installed in conformity with this code shall be listed for the purpose for which it is used. Fire alarm systems and components shall be California State Fire Marshal approved and listed in accordance with California Code of Regulations, Title 19, Division 1.

**Revise Section 10.3.3 to read as follows:**

**10.3.3** All devices and appliances that receive their power from the initiating device circuit or signaling line circuit of a control unit shall be California State Fire Marshal listed for use with the control unit.

**Revise Section 10.7.1 to read as follows:**

**10.7.1** Where approved by the authority having jurisdiction, ECS priority signals when evaluated by stakeholders through risk analysis in accordance with 24.3.11 shall be permitted to take precedence over all other signals.

**Revise Section 12.3.8.1 to read as follows:**

**12.3.8.1** The outgoing and return (redundant) circuit conductors shall be permitted in the same cable assembly (i.e., multiconductor cable), enclosure, or raceway only under the following conditions:

- (1) For a distance not to exceed 10 ft (3.0 m) where the outgoing and return conductors enter or exit the initiating device, notification appliance, or control unit enclosures
- (2) Single drops installed in the raceway to individual devices or appliances
- (3)\*In a single room not exceeding 1000 ft<sup>2</sup> (93 m<sup>2</sup>) in area, a drop installed in the raceway to multiple devices or appliances that does not include any emergency control function devices
- (4) Where the vertically run conductors are contained in a 2-hour rated cable assembly, or enclosed (installed) in a 2-hour rated enclosure or a listed circuit integrity (C.I.) cable, which meets or exceeds a 2-hour fire resistive rating.

**Revise Section 14.4.6.1 to read as follows:**

**14.4.6.1 Testing.** Household fire alarm systems shall be tested in accordance with the manufacturer's published instructions according to the methods of Table 14.4.3.2.

**Revise Section 17.15 to read as follows:**

**17.15 Fire Extinguisher Electronic Monitoring Device.** A fire extinguisher electronic monitoring device shall indicate those conditions for a specific fire extinguisher required by California Code of Regulations, Title 19, Division 1, Chapter 1, Section 574.2 (c) and California Fire Code to a fire alarm control unit.

**Revise Section 21.3.6 to read as follows:**

**21.3.6** Smoke detectors shall not be installed in unsprinklered elevator hoistways unless they are installed to activate the elevator hoistway smoke relief equipment or where required by Chapter 30 of the California Building Code.

**Revise Section 23.8.5.1.2 to read as follows:**

**23.8.5.1.2** Where connected to a supervising station, fire alarm systems employing automatic fire detectors or waterflow detection devices shall include a manual fire alarm box to initiate a signal to the supervising station.

**Exception:** Fire alarm systems dedicated to elevator recall control, and supervisory service and fire sprinkler monitoring as permitted in Section 21.3 of NFPA 72.

**Revise Section 23.8.5.4.1 to read as follows:**

**23.8.5.4.1 Systems equipped with alarm verification features shall be permitted under the following conditions:**

- (1) The alarm verification feature is not initially enabled unless conditions or occupant activities that are expected to cause nuisance alarms are anticipated in the area that is protected by the smoke detectors. Enabling of the alarm verification feature shall be protected by password or limited access.
- (2) A smoke detector that is continuously subjected to a smoke concentration above alarm threshold does not delay the system functions of Sections 10.7 through 10.16, 23.8.1.1, or 21.2.1 by more than 30 seconds.
- (3) Actuation of an alarm-initiating device other than a smoke detector causes the system functions of Sections 10.7 through 10.16, 23.8.1.1, or 21.2.1 without additional delay.
- (4) The current status of the alarm verification feature is shown on the record of completion (see Figure 7.8.2(a), item 4.3).
- (5) Operation of a patient room smoke detector in I-2 and R-2.1 Occupancies shall not include an alarm verification feature.

**Revise Section 29.3.1 to read as follows:**

**29.3.1** All devices, combinations of devices, and equipment to be installed in conformity with this chapter shall be approved and listed by the California State Fire Marshal for the purposes for which they are intended.

**Revise Section 29.5.2.1.1 to read as follows:**

**29.5.2.1.1\* Smoke and Heat Alarms.** Unless exempted by applicable laws, codes, or standards, smoke or heat alarms used to provide a fire-warning function, and when two or more alarms are installed within a dwelling unit, suite of rooms, or similar area, shall be arranged so that the operation of any smoke or heat alarm causes all alarms within these locations to sound.

*Note:* Exception to 29.5.2.1.1 not adopted by the SFM

NFPA—continued

Add Section 29.7.2.1 to read as follows:

29.7.2.1 The alarm verification feature shall not be used for household fire warning equipment.

Add Section 29.7.6.7.1 to read as follows:

29.7.6.7.1 The alarm verification feature shall not be used for household fire warning equipment.

Revise Section 23.8.3.4 to read as follows:

23.8.3.4 Specific location requirements. The installation of smoke alarms and smoke detectors shall comply with the following requirements:

- (1) Smoke alarms and smoke detectors shall not be located where ambient conditions, including humidity and temperature, are outside the limits specified by the manufacturer's published instructions.
- (2) Smoke alarms and smoke detectors shall not be located within unfinished attics or garages or in other spaces where temperatures can fall below 40°F (4°C) or exceed 100°F (38°C).
- (3) Where the mounting surface could become considerably warmer or cooler than the room, such as a poorly insulated ceiling below an unfinished attic or an exterior wall, smoke alarms and smoke detectors shall be mounted on an inside wall.
- (4) Smoke alarms or smoke detectors shall be installed a minimum of 20 feet horizontal distance from a permanently installed cooking appliance.

**Exceptions:** Ionization smoke alarms with an alarm silencing switch or photoelectric smoke alarms shall be permitted to be installed 10 feet (3 m) or greater from a permanently installed cooking appliance.

Photoelectric smoke alarms shall be permitted to be installed greater than 6 feet (1.8 m) from a permanently installed cooking appliance where the kitchen or cooking area and adjacent spaces have no clear interior partitions and the 10 ft distances would prohibit the placement of a smoke alarm or smoke detector required by other sections of the code.

Smoke alarms listed for use in close proximity to a permanently installed cooking appliance.

- (5) Effective January 1, 2016, smoke alarms and smoke detectors used in household fire alarm systems installed between 6 ft (1.8 m) and 20 ft (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be listed for resistance to common nuisance sources from cooking.
- (6) Installation near bathrooms. Smoke alarms shall be installed not less than a 3-foot (0.91 m) horizontal distance from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by other sections of the code.
- (7) Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal path from the supply registers of a forced air heating or cooling system and shall be installed outside of the direct airflow from those registers.
- (8) Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal path from the tip of the blade of a ceiling-suspended (paddle) fan.
- (9) Where stairs lead to other occupied levels, a smoke alarm or smoke detector shall be located so that smoke rising in the stairway cannot be prevented from reaching the smoke alarm or smoke detector by an intervening door or obstruction.
- (10) For stairways leading up from a basement, smoke alarms or smoke detectors shall be located on the basement ceiling near the entry to the stairs.
- (11) For tray-shaped ceilings (coffered ceilings), smoke alarms and smoke detectors shall be installed on the highest portion of the ceiling or on the sloped portion of the ceiling within 12 in. (300 mm) vertically down from the highest point.
- (12) Smoke alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.7.3.2.4 of NFPA 72.
- (13) Heat alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.6.3 of NFPA 72.

85—15	Boiler and Combustion Systems Hazards Code . . . . .	G2452.1
211—13	Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances . . . . .	R1002.5, G2427.5.5.1
252—03	Standard Methods of Fire Tests of Door Assemblies . . . . .	R337.8.3
257—13	Standard for Fire Test for Window and Glass Block Assemblies . . . . .	R337.8.2.1
259—13	Test Method for Potential Heat of Building Materials . . . . .	R316.5.7, R316.5.8
275—13	Standard Method of Fire Tests for the Evaluation of Thermal Barriers . . . . .	R316.4
286—15	Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth . . . . .	R302.9.4, R316.6
501—13	Standard on Manufactured Housing . . . . .	R202
720—15	Standard for the Installation of Carbon Monoxide (CO) Detectors and Warning Equipment . . . . .	R315.6.1, R315.6.2
853—15	Standard on the Installation of Stationary Fuel Cell Power Systems . . . . .	M1903.1

**REFERENCED STANDARDS**

**NSF**

NSF International  
789 N. Dixboro  
Ann Arbor, MI 48105

Standard reference number	Title	Referenced in code section number
14—2011	Plastics Piping System Components and Related Materials . . . . .	M1301.4, P2609.3, P2908.3
41—2011	Nonliquid Saturated Treatment Systems (Composting Toilets) . . . . .	P2725.1
42—2011	Drinking Water Treatment Units—Anesthetic Effects . . . . .	P2909.1, P2909.3
44—2012	Residential Cation Exchange Water Softeners . . . . .	P2909.1, P2909.3
50—2012	Equipment for Swimming Pools, Hot Tubs and Other Recreational Water Facilities . . . . .	P2911.8.1
53—2011A	Drinking Water Treatment Units—Health Effects . . . . .	P2909.1, P2909.3
58—2012	Reverse Osmosis Drinking Water Treatment Systems . . . . .	P2909.2, P2909.3
61—2012	Drinking Water System Components—Health Effects . . . . .	P2609.5, P2722.1, P2903.9.4, P2906.4, P2906.5, P2906.6, P2908.3
350—2011	Onsite Residential and Commercial Water Reuse Treatment Systems . . . . .	P2910.6.1
358-1—2011	Polyethylene Pipe and Fittings for Water-based Ground Source “Geothermal” Heat Pump Systems . . . . .	M2105.4, M2105.5, Table AG101.1
358-2—2012	Polypropylene Pipe and Fittings for Water-based Ground Source “Geothermal” Heat Pump Systems . . . . .	M2105.5
359—2012	Valves for Crosslinked Polyethylene (PEX) Water Distribution Tubing Systems . . . . .	Table P2903.9.4
372—2010	Drinking Water Systems Components—Lead Content . . . . .	P2906.2.1

**PCA**

Portland Cement Association  
5420 Old Orchard Road  
Skokie, IL 60077

Standard reference number	Title	Referenced in code section number
100—12	Prescriptive Design of Exterior Concrete Walls for One- and Two-family Dwellings (Pub. No. EB241) . . . . .	R301.2.2.2.4, R301.2.2.3.4, R404.1.3, R404.1.3.2.1, R404.1.3.2.2, R404.1.3.4, R404.1.4.2, R608.1, R608.2, R608.5.1, R608.9.2, R608.9.3

**SBCA**

Structural Building Components Association  
6300 Enterprise Lane  
Madison, WI 53719

Standard reference number	Title	Referenced in code section number
BCSI—2013	Building Component Safety Information Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses . . . . .	502.11.2, 802.10.3
CFS-BCSI—2008	Cold-formed Steel Building Component Safety Information (CFSBCSI) Guide to Good Practice for Handling, Installing & Bracing of Cold-formed Steel Trusses . . . . .	505.1.3, 804.3.6
FS100—12	Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies . . . . .	R316.8

**SFM**

State of California  
Department of Forestry and Fire Protection  
Office of the State Fire Marshal  
P.O. Box 944246  
Sacramento, CA 944246-2460

Standard reference number	Title	Referenced in code section number
SFM 12-3	Releasing Systems for Security Bars in Dwellings . . . . .	R310
SFM 12-7A-1	Exterior Wall Siding and Sheathing . . . . .	R327.5.3, R327.6.3.1, R327.6.3.2.3
SFM 12-7A-2	Exterior Window . . . . .	R327.5.3, R327.6.3.2.2
SFM 12-7A-3	Horizontal Protection Underside . . . . .	R327.5.3, R327.6.2.3

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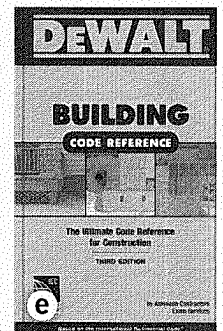
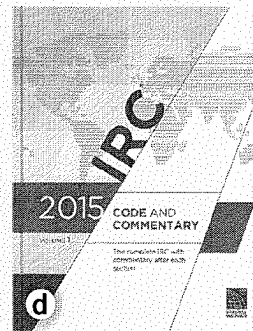
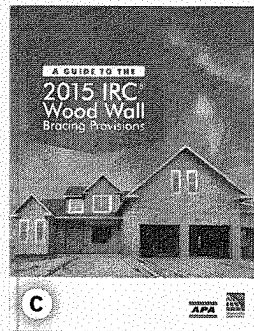
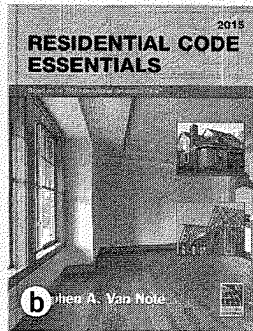
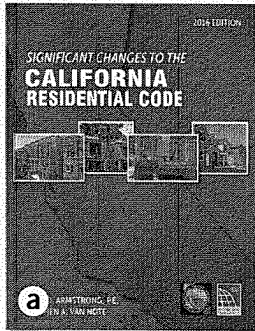
# HISTORY NOTE APPENDIX

## California Residential Code Title 24, Part 2.5, California Code of Regulations (CCR)

For prior code history, see the History Note Appendix to the *California Residential Code*, 2013 Triennial Edition, effective January 1, 2014.

1. (HCD 02/15, SFM 05/15) - Adopt the 2015 edition of the *International Residential Code* published by the International Code Council, for incorporation into the 2016 *California Residential Code*, CCR Title 24, Part 2.5 with amendments for State regulated occupancies, effective on January 1, 2017.
2. Errata to correct editorial errors within the preface as well as throughout various chapters in this code. Effective January 1, 2017.
3. Errata to correct editorial errors throughout the code. Effective September 1, 2017.
4. *2016 Intervening Update (SFM 02/16 and HCD 01/16), Adopted by the California Building Standards Commission on August 14, 2017, published on January 1, 2018, effective on July 1, 2018.*





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## d. 2015 IRC® Code and Commentary, Volume 1 (Chapters 1–11)

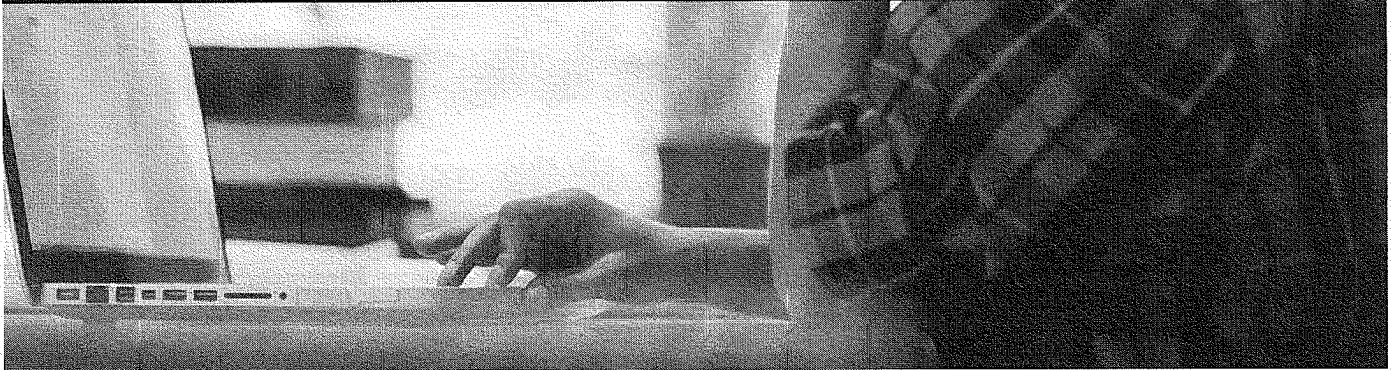
This helpful publication contains the full text of 2015 IRC Chapters 1–11, including tables and figures, followed by corresponding commentary at the end of each section to help code users understand the intent of the code provisions and learn how to apply them effectively.

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